I-83 NORTH YORK
WIDENING PROJECT
S.R. 0083, SECTION 070
PRELIMINARY DESIGN NOISE ANALYSIS

SPRING GARDEN, SPRINGETTSBURY AND MANCHESTER TOWNSHIPS AND NORTH YORK BOROUGH
YORK COUNTY, PENNSYLVANIA

PREPARED FOR

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DISTRICT 8-0

PREPARED BY

SKELLY AND LOY
ENGINEERING - ENVIRONMENTAL
CONSULTANTS

JULY 2019

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JULY 8, 2019

R12-0516.006

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I. EXECUTIVE SUMMARY

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A preliminary design noise analysis was conducted for the I-83 North York Widening Project located in York County, Pennsylvania. The project consists of a reconstruction and widening of the roadway from two to three travel lanes in each direction, from approximately 1,950 feet north of the Mount Rose Avenue (Exit 18) interchange in the south to the Locust Lane overpass in the north. Within this approximate five-mile corridor, the Market Street (Exit 19) interchange, U.S. Route 30 (Exit 21) interchange, and North George Street (Exit 22) interchange will all be reconstructed. Along with the roadway widening and interchange reconstructions, the design also incorporates the construction of additional auxiliary lanes and overhead and mainline bridge replacements. The goals of the project are to reduce traffic congestion, improve roadway safety, replace functionally obsolete bridges, and improve the system linkage between I-83 and U.S. Route 30 by reconstructing this section of I-83 into a more functional and modern roadway that maximizes the use of current design criteria.

The noise analysis involved the measurement of existing noise levels, modeling of existing (2014) and design year (2042) noise conditions, and design year noise impact assessment and noise abatement evaluations within the project study area. Noise-sensitive land uses were identified and grouped into 15 unique Noise Study Areas (NSAs) to facilitate the analysis.

Two additional NSAs within the project area were identified and analyzed as part of the S.R. 0181-017 North George Street/Exit 22 Improvements Preliminary Design Noise Analysis, conducted in 2018 with a report prepared in August 2018. That report is included as Appendix G to this document, and the two NSAs associated with that analysis are presented on the figures of this report. All other data pertaining to the S.R. 0181-017 noise analysis, including noise measurements, noise modeling, impact assessment, and mitigation consideration are available in Appendix G and are not included or discussed in the main body of this report.

Within the 15 NSAs identified in the I-83 North York corridor, noise levels at 246 noise receptors (representing 387 equivalent residential units) were predicted and compared to the Federal Highway Administration (FHWA)/Pennsylvania Department of Transportation (PennDOT) noise abatement criteria (NAC) to determine noise impacts.

Noise impacts for the design year (2042) conditions were identified within 10 of the 15 NSAs. Noise barriers to reduce elevated traffic noise levels were evaluated within nine of these NSAs to determine feasibility and reasonableness. A noise barrier was unable to be evaluated for noise-impacted parcels along East Market Street within NSA 15 without prohibiting pedestrian access to multiple commercial properties located along East Market Street. Noise barriers were determined to be both feasible and reasonable for NSAs 01, 02, 03, 04, and 16. Noise barriers

were determined to be feasible but not reasonable for NSAs 10, 13, and 14. Noise barriers were determined to be not feasible for NSAs 09 and 15. Table I-1 presents a summary of the results of the barrier analyses.

TABLE I-1
NOISE BARRIER ANALYSIS SUMMARY

NOISE STUDY AREA	NUMBER OF NOISE IMPACTS	NOISE BARRIER LENGTH (FT)	AVERAGE NOISE BARRIER HEIGHT (FT)	NOISE BARRIER AREA (FT^2)	NUMBER OF BENEFITING RESIDENCES	SF/BR (FT^2 PER BENEFITED RESIDENCE)	FEASIBLE/ REASONABLE
01	85	4,566	15.7	71,464	140	510	Yes / Yes
02	36	2,374	15	35,799	60	597	Yes / Yes
03 and 04	13	2,458	18	44,249	35	1,264	Yes / Yes
09	4	429	14	6,000	3	2,000	No / No*
10	5	864	16.2	13,960	3	4,653	Yes / No
13	2	1,816	14	25,420	6	4,237	Yes / No
14	3	720	20	14,400	3	4,800	Yes / No
16	13	2,231	16	35,688	24	1,487	Yes / Yes
NSA 02 (S.R. 0181-017)	36	2,182	17	37,096	56	662	Yes / Yes

* Although the evaluated abatement design for NSA 09 provides the required noise reductions and meets the SF/BR threshold, it was determined that a retaining wall would be required to construct a noise barrier at the proposed location. The additional cost to construct and maintain a retaining wall required solely to support a noise barrier was determined to be cost prohibitive, resulting in a not feasible determination for noise abatement.

A more detailed review will be completed during the final design of the project. As such, noise barriers that are found to be feasible and reasonable during the preliminary noise analysis may also not be found to be feasible and reasonable during the final design noise analysis. Conversely, noise barriers that were not considered feasible and reasonable may meet the established criteria and be recommended for construction.

II. INTRODUCTION

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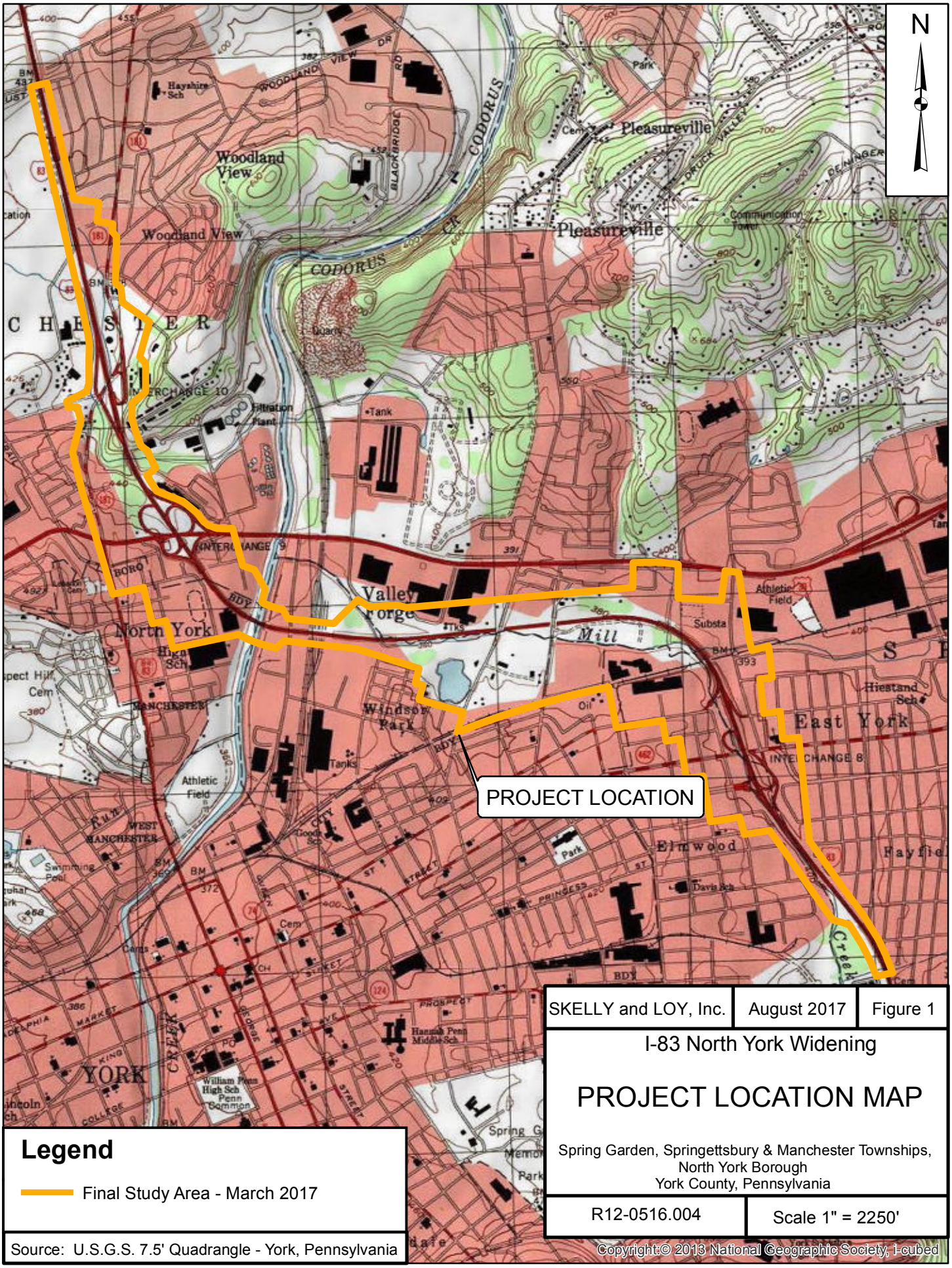
A preliminary design noise analysis was conducted for the I-83 North York Widening Project located in York County, Pennsylvania. The project consists of a reconstruction and widening of the roadway from two to three travel lanes in each direction, from approximately 1,950 feet north of the Mount Rose Avenue (Exit 18) interchange in the south to the Locust Lane overpass in the north, encompassing approximately five miles within Spring Garden Township, Springettsbury Township, North York Borough, and Manchester Township. Within this approximate five-mile corridor, the Market Street (Exit 19) interchange, U.S. Route 30 (Exit 21) interchange, and North George Street (Exit 22) interchange will all be reconstructed. Figure 1 presents the location of the project study area.

The objective of this noise analysis is to assess the potential traffic noise impacts associated with the proposed widening and improvement project and to evaluate potential noise abatement measures wherever noise impacts are predicted to occur. This report presents a summary of the steps involved in the traffic noise analysis and includes a description of noise terminology, applicable standards and criteria, noise monitoring and modeling methodology, noise impact evaluation, construction noise considerations, and information for local government officials.

All highway noise impact assessment procedures, noise abatement criteria, and documentation are in accordance with PennDOT's "Publication #24: Project Level Highway Traffic Noise Handbook," November 2015. PennDOT guidelines are in accordance with FHWA regulations at 23 CFR 772.


N
PROJECT LOCATION
Woodland View
Pleasureville
CODORUS
Valley Forge
North York
East York
Windsor Park
Elmwood
YORK
Legend
Final Study Area - March 2017
Source: U.S.G.S. 7.5' Quadrangle - York, Pennsylvania
SKELLY and LOY, Inc.
August 2017
Figure 1
I-83 North York Widening
PROJECT LOCATION MAP
Spring Garden, Springettsbury & Manchester Townships,
North York Borough
York County, Pennsylvania
R12-0516.004
Scale 1" = 2250'
Copyright© 2013 National Geographic Society, i-cubed

III. FUNDAMENTALS OF SOUND AND METHODOLOGY

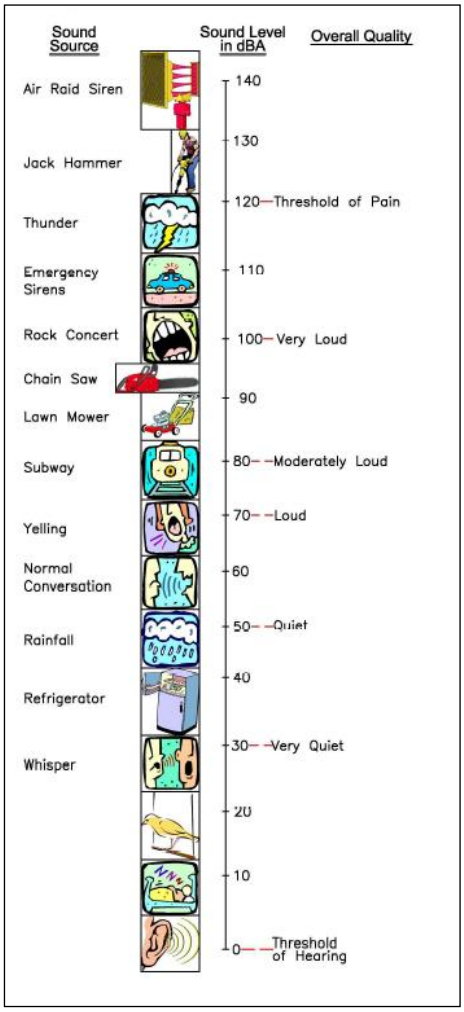
III. FUNDAMENTALS OF SOUND AND METHODOLOGY

A. FUNDAMENTALS OF SOUND

Sound is the vibration of air molecules in waves similar to ripples on water. When these vibrations reach our ears, we hear what we call sound. Noise is defined as “unwanted sound.” Therefore, it can be considered a psychological phenomenon and not a physical one. The roar of racecars adds to the excitement of spectators and hence would be considered sound. This same roar may annoy nearby neighbors, thereby becoming noise. Factors playing a role in the perception of sound include magnitude, amplitude, duration, frequency, source, and receiver.

The intensity or loudness of sound is measured in units referred to as decibels (dB). Sound waves are created by the rapid movement of an object, and the rate at which the object moves back and forth is called its frequency, measured in hertz (Hz). While the human ear can detect sounds from about 20 to 20,000 Hz, it is more sensitive to frequencies between 500 and 4,000 Hz. To account for this occurrence, the A-weighted scale has been developed to place an emphasis on those frequencies which are more detectable to the human ear. The A-weighted scale, which has been in existence for over 40 years, is generally used in community and city noise ordinances and is expressed in units of dBA (decibels in the A-weighting). Researchers have established a correlation between the measurement of sound, the A-weighted decibel (dBA), and its associated perceived human response. Figure 2 represents this correlation of qualitative and quantitative descriptions. The A-weighted scale weighs the sound measurement unit of decibels to match the response of the human ear. It accounts for the fact that sounds of equal amplitude but different frequencies are not necessarily perceived to be equally loud.

FIGURE 2
COMMON SOUND LEVELS

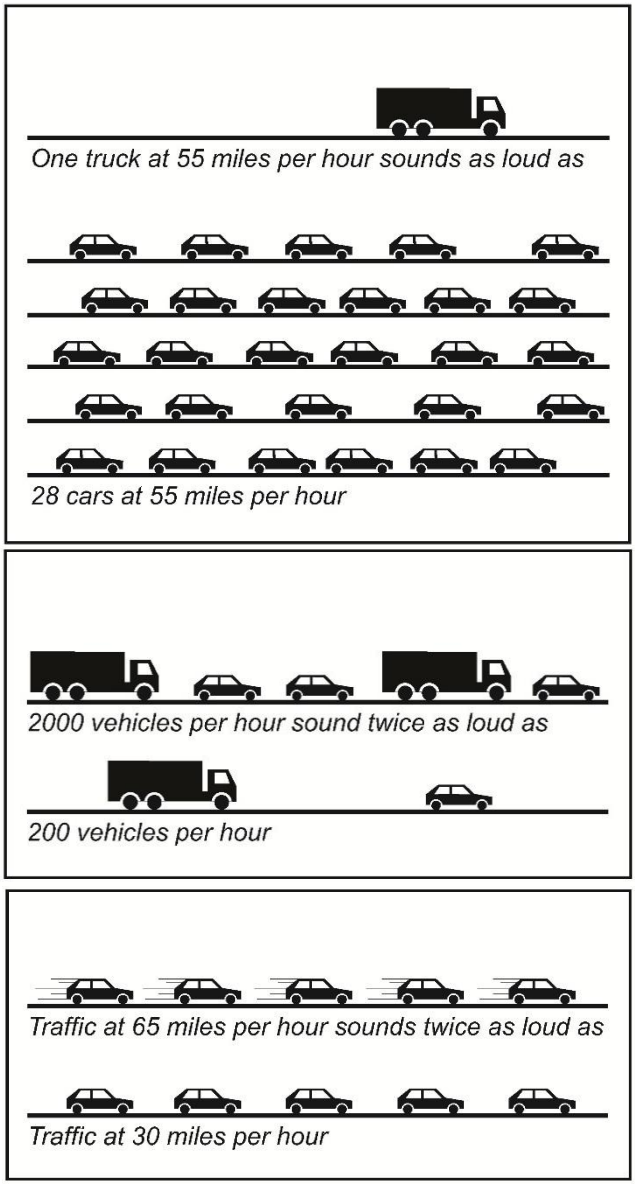


Because sound is actually an energy level, it must be recorded on a logarithmic scale and expressed in

logarithmic units called decibels (dB). Given this scale, a doubling of a noise source will result in a three-decibel increase in total level (i.e., 50 dBA + 50 dBA = 53 dBA, not 100 dBA). Typically, a change in sound level between 2 and 3 dBA is barely perceptible while a change of 5 dBA is readily noticeable by most people. A 10 dBA increase is usually perceived as a doubling of loudness and, conversely, noise is perceived to be reduced by one-half when a sound level is reduced by 10 dBA.

The principal noise sources of highway vehicles are the exhaust system, engine, and tires. Exhaust noise is typically controlled by mufflers, assuming that they are used and are functioning properly. Engine noise can be controlled only by vehicle manufacturers and proper maintenance, factors over which PennDOT has no control. Tire noise is generated by the interaction of each vehicle's tires with the road surface. Engine and exhaust noise are usually louder than tire noise at vehicular speeds under 30 miles per hour. The reverse is normally true for vehicular speeds over 30 miles per hour. Highways are typically dominated by tire noise while local streets are typically dominated by engine and exhaust noise. The overall noise level generated by vehicles on a highway depends on the number of vehicles, the speed of the vehicles, and the types of vehicles. Figure 3 depicts generally how these factors influence noise levels.

FIGURE 3
TRAFFIC NOISE RELATIONSHIPS



B. METHODOLOGY

The first step of the preliminary design noise analysis is to assess the existing acoustical environment. Noise monitoring of existing conditions is the primary means of establishing background noise levels and propagation characteristics throughout the project area. The initial

phase of the monitoring process is the identification and selection of noise-sensitive receptors. Sensitive receptors are defined as those land uses which are especially susceptible to noise impacts. These may include hospitals, schools, residences, motels, hotels, recreational areas, parks, and places of worship. The sensitive receptors identified within the project study are considered Activity Categories B, C, D, and E as defined by the FHWA traffic noise regulations (23 CFR Part 772) and are summarized in Table III-1. This table provides a brief description of the various activity categories as well as the absolute federal/state noise criteria for each.

TABLE III-1
NOISE ABATEMENT CRITERIA
HOURLY A-WEIGHTED SOUND LEVEL IN DECIBELS (dBA)

ACTIVITY CATEGORY	Leq(h)[1]	DESCRIPTION OF ACTIVITY CATEGORY
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[2]	67(Exterior)	Residential
C[2]	67 (Exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E[2]	72 (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A, B, or C.
F	--	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	--	Undeveloped lands that are not permitted.

[1] Impact thresholds should not be used as design standards for noise abatement purposes.
[2] Includes undeveloped lands permitted for this activity category
Source: 23 CFR Part 772

Upon selection of noise-sensitive receptors, monitoring of the existing acoustical environment at these receptors is conducted. All monitoring for this project was performed using Metrosonics dB-3080 sound analyzers. Field calibration of the meters was performed immediately prior to noise monitoring using a Metrosonics cl-304 sound level calibrator. The sound analyzers were post-calibrated subsequent to the measurements using a Metrosonics

cl-304 sound level calibrator. This equipment meets all requirements of the American National Standard Specification for Sound Level Meters, ANSI S1.4-1983 (R1990), Type 2.

Noise measurements were in the A-weighted scale and reported in decibels (dBA). The data collection procedure involved the Leq measurements in consecutive 30-second intervals. This method allows individual time intervals that include noise events unrelated to traffic noise (such as aircraft overflights) to be excluded from consideration. Hourly average noise levels [Leq(h)] were derived at each location from the 20-minute Leq values. Existing noise measurements were collected under meteorologically acceptable conditions when the pavement was dry and winds were calm or light. Additional data collected at each monitoring location included atmospheric conditions such as wind speed, humidity, and ambient temperature. Monitoring was conducted in accordance with the U.S. Department of Transportation, FHWA "Measurement of Highway-Related Noise," FHWA Report No. FHWA-PD-96-046, May 1996.

Traffic counts are also taken on roadways which significantly contribute to the overall noise levels during the monitoring period. Traffic is grouped into one of three categories: cars, medium trucks, and heavy trucks. Medium trucks are defined as vehicles having two axles and six wheels (between 4,500 and 12,000 kilograms [Kg]), heavy trucks are vehicles having three or more axles (greater than 12,000 Kg), and cars are the remainder.

Upon completion of noise monitoring, a computer model of the existing roadway network and monitored receptors is constructed using data from digital topographical maps, highway design files, traffic volumes recorded in the field, and surveying (GPS) of existing terrain. Modeling of the project area is accomplished by applying the FHWA Traffic Noise Model (TNM) computer model, Version 2.5. This program is described in the U.S. Department of Transportation "FHWA Traffic Noise Model User's Guide," FHWA-PD-96-009, January 1998. The model has been established as a reliable tool for representing noise generated by highway traffic.

To represent the actual conditions, a numerical coordinate system of the roadway network and receivers is used. The TNM computer model uses a three-dimensional Cartesian coordinate (X, Y, and Z) system to represent the roadways, terrain features, and receivers in the study area. Noise levels can then be predicted for various scenarios of traffic flow, geometrics, and topography. In addition to the definition of physical features within the coordinate geometry system, traffic volumes and speeds for each of the three vehicle types are entered into the model as two other categories of input variables.

The modeling process continues with model validation in accordance with PennDOT procedures. This is performed by comparing the monitored noise levels with noise levels generated by the computer model, using the traffic volumes and speeds that were collected during the

monitoring process. This comparison ensures that reported changes in noise levels between future and existing conditions are due to changes in conditions and do not erroneously reflect discrepancies between the modeling and monitoring techniques. A difference between the monitored and modeled levels of three decibels or less is considered acceptable (this is the limit of change detectable by typical human hearing) and is used by PennDOT as the calibration benchmark. Following validation of the existing conditions models, additional modeling sites are added to thoroughly predict existing noise levels throughout the project and to determine the baseline sound-level data at these modeling sites where no field measurements were made.

The next step in the noise analysis is to project future, design year noise levels with the proposed alignment in place and determine if the future levels will approach or exceed the noise abatement criteria (NAC). If the criteria are approached or exceeded at any receptor (or residence represented by that receptor), abatement considerations are warranted to attempt to provide a substantial noise reduction at the noise-impacted receptor. The future design model is created by adding the roadway design into the existing conditions model. Projected design year traffic volumes, compositions, and speeds are assigned to all roadways, and future noise levels are predicted.

After future noise levels have been predicted, mitigation analysis is performed. The three steps of mitigation analysis are determining where noise abatement consideration is warranted, determining if noise abatement is feasible, and determining if noise abatement is reasonable. Abatement consideration is warranted where future noise levels have been predicted to approach or exceed the NAC. Federal procedures require the state to specify the level which "approaches" the criteria. PennDOT defines approaching as within 1 dBA of the NAC. In addition, federal procedures stipulate that abatement considerations are required if the project results in a "substantial noise increase" above existing conditions. PennDOT regulations state that if a future predicted noise level at any given receptor approaches or exceeds the appropriate abatement criterion or if future predicted traffic noise levels substantially exceed the existing noise levels by 10 dBA or greater, abatement considerations are required.

After identifying areas where abatement consideration is warranted, the feasibility of potential mitigation is then analyzed. Feasibility deals with engineering considerations; specifically, can a substantial noise reduction be achieved given the conditions of a specific location. Feasibility questions include:

1) Can a noise reduction of at least 5 dBA be achieved at the majority of impacted receptors?

2) Can a noise barrier be designed and physically constructed at the proposed location?

3) Can the noise barrier be constructed without causing safety issues or restrict vehicular/pedestrian access?

4) Can the noise barrier be constructed in a manner that allows maintenance access and utilities and drainage to adequately function.

If the proposed mitigation scenario (typically vertical concrete barriers or earth berms) can satisfy these requirements, the mitigation is considered feasible.

If mitigation has been determined to be feasible, the reasonableness of the mitigation is analyzed. Reasonableness is a more subjective criterion than feasibility. This determination takes into account the cost-effectiveness of the mitigation, acoustic performance, and the desires of individuals impacted by highway traffic noise. If the majority of benefiting residents and property owners do not want the noise barrier, it is not considered to be reasonable. If the abatement effectiveness is less than 2,000 square feet (ft^2) per benefited receptor (BR), it is considered reasonable (pending public input). In addition, the majority of benefited receptors need to obtain a 5-dBA reduction, with at least one receptor receiving a 7-dBA reduction. Other optional factors are considered during the reasonableness phase although, singly, these factors cannot eliminate an abatement measure.

Following is a discussion of the existing conditions, predicted future conditions, and mitigation alternatives and recommendations.

IV. EXISTING NOISE ENVIRONMENT

IV. EXISTING NOISE ENVIRONMENT

A. SHORT-TERM NOISE MONITORING

Short-term noise monitoring is not a process to determine design year noise impacts or barrier locations. Short-term noise monitoring provides a level of consistency between what is present in real-world situations and how that is represented in the computer noise model. Short-term monitoring does not need to occur within every NSA to validate the computer noise model.

Due to traffic congestion during A.M. and P.M. Peak Hour traffic periods, short-term noise measurements of 20 minutes in duration were obtained during off-peak traffic hours at 14 locations on December 11, 2018, and March 27, 2019. A summary of the short-term noise monitoring results is presented in Table IV-1. For each site, the table lists the site identification number, location, and monitored sound level. The site identification number for the noise monitoring sites corresponds to the traffic monitoring session during which the noise measurement was taken.

TABLE IV-1
SHORT-TERM NOISE MONITORING SUMMARY

NOISE STUDY AREA	SITE ID	SITE DESCRIPTION	MONITORED SOUND LEVEL (DBA)
01	TMS 5-1	1871 3rd Avenue	67
	TMS 5-2	150 South Manheim Street	70
	TMS 5-3	1834 Eastern Boulevard	64
	TMS 5-6	1770 East Market Street	67
02	TMS 4-3	54 North Oxford Street	67
	TMS 4-6	1775 East Market Street	64
03	TMS 3-2	1550 11th Avenue	68
06	TMS 2-2	222 Arsenal Road	66
	TMS 2-3	222 Arsenal Road	68
07	TMS 2-1	267 Point Circle	64
14	TMS 4-1	69 North Yale Street	65
	TMS 4-2	28 North Belmont Street	62
16	TMS 6-1	400 Elmwood Boulevard	66
	TMS 6-2	1759 3rd Avenue	66

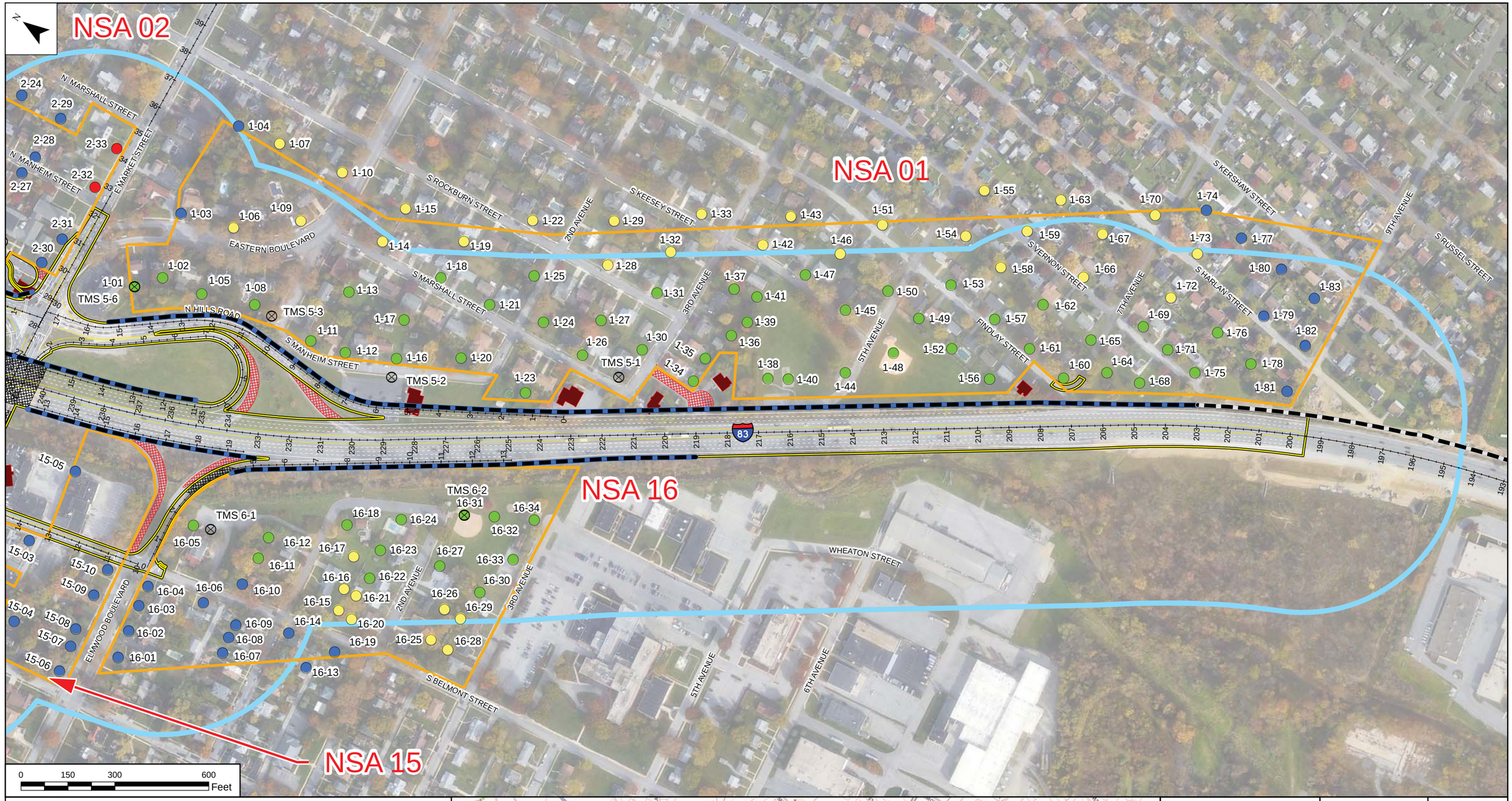
The location of each noise monitoring site is presented on Figures 4A through 4G. Additional noise monitoring data (site sketches, meter printouts, and calibration certificates) are located in Appendices A through C. The monitored sound levels in the study corridor ranged from 62 to 70 dBA. Traffic noise from I-83 was the dominant source of noise at each of the monitoring locations.

B. NOISE MODEL VALIDATION

Noise monitoring data are primarily utilized to validate the computer model used to predict existing and future levels. Upon measurement of the existing noise levels, a three-dimensional noise model of the existing roadway network was constructed which incorporates all significant terrain features that define the propagation path between the roadway and noise-sensitive receptors. Traffic volumes, composition, and speeds that were observed during the short-term monitoring periods were used as inputs to generate the validation models sound levels. A difference of ±3 dBA or less between the monitored noise levels and the computer modeled noise levels is considered acceptable, as this is the limit of change detectable by the typical human ear. This computer model validation verifies that the sound propagation paths within the model are accurate and that the modeling techniques are correct and ensures that reported changes between the existing and future design year conditions are due to changes in traffic or propagation path as opposed to discrepancies between monitoring and modeling techniques.

The model validation was performed for the existing traffic conditions observed and recorded during the measurement period. As these noise measurements were not necessarily obtained during the existing loudest hour, the existing noise levels obtained during the 20-minute short-term monitoring session were not reported as the project's existing noise levels. Instead, the validated existing conditions TNM noise model was used to generate existing loudest-hour noise levels by using Peak Hour Volumes and truck percentages supplied by traffic engineers as model inputs.

A summary of the model validation is presented in Table IV-2. All 14 monitored locations were able to be accurately modeled within the acceptable ±3 dBA range. For the majority of the modeling locations, propagation paths were non-complex with relatively simple terrain features. Due to the relatively close proximity of the monitoring locations to I-83 and absence of other major noise sources, traffic noise was the most dominant component of the acoustic environment at each monitoring location.



Legend

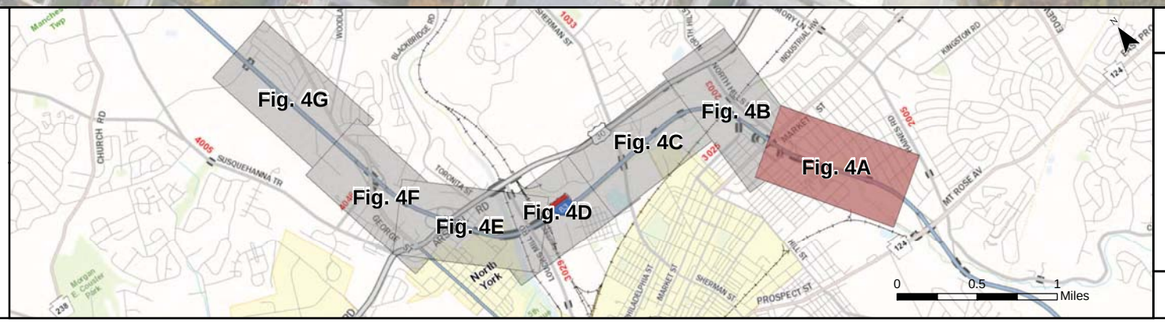
- PROPOSED EDGE OF SHOULDER
- 500' BUFFER
- NOISE STUDY AREAS
- MAINLINE CENTERLINE
- DISPLACED BUILDINGS
- PAVEMENT REMOVAL
- BRIDGE DECKING
- NOISE MEASUREMENT LOCATION

MODELED NOISE RECEPTORS

- IMPACTED, BENEFITTED
- IMPACTED, NOT BENEFITTED
- NOT IMPACTED, BENEFITTED
- NOT IMPACTED, NOT BENEFITTED

POTENTIAL BARRIERS

- BARRIER FEASIBLE NOT REASONABLE
- BARRIER NOT FEASIBLE
- BARRIER FEASIBLE AND REASONABLE
- EXISTING NOISE WALL



SKELLY and LOY, Inc.	May 2019	Figure 4A

I-83 NORTH YORK WIDENING PROJECT
S.R. 0083, SECTION 070

NOISE STUDY AREAS, NOISE RECEPTOR AND MITIGATION LOCATIONS

YORK COUNTY, PENNSYLVANIA

Job No.: R12-0516.006	11" X 17" : 1" = 300'

jfrank | 5/22/2019 7:44:31 PM

Document Path: Z:\R12-0516\NSA Mapping.mxd

N

NSA 01

NSA 02

NSA 14

NSA 15

NSA 16

N MARSHALL STREET

EASTERN BOULEVARD

E MARKET STREET

S MANHEIM STREET

N MANHEIM STREET

N HILLS ROAD

INDUSTRIAL HIGHWAY

WALLACE STREET

N OXFORD STREET

E PHILADELPHIA STREET

TMS 4-3

TMS 4-6

TMS 5-6

TMS 5-3

TMS 6-1

TMS 4-2

TMS 4-1

N BELMONT STREET

ELMWOOD BOULEVARD

N YALE STREET

MORSE AVENUE

WAYNE AVENUE

E CLARKE AVENUE

BEECH ALLEY

N OGONTZ STREET

WHITEFORD ROAD

0 150 300 600 Feet

Legend

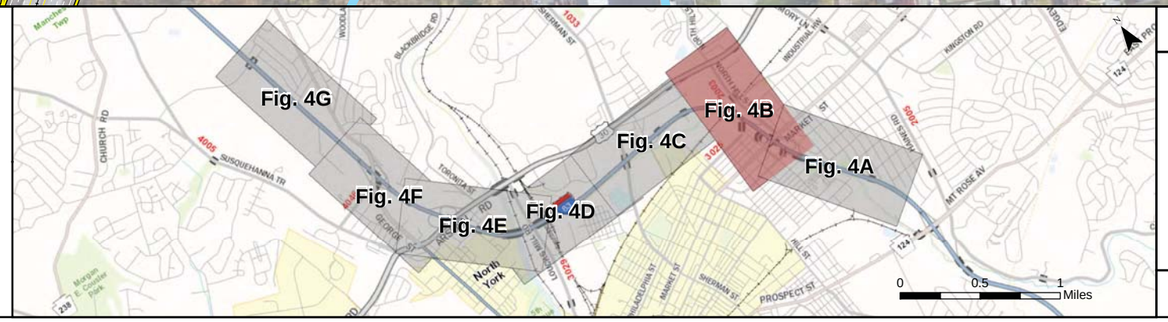
- PROPOSED EDGE OF SHOULDER
- 500' BUFFER
- NOISE STUDY AREAS
- MAINLINE CENTERLINE
- DISPLACED BUILDINGS
- PAVEMENT REMOVAL
- BRIDGE DECKING
- NOISE MEASUREMENT LOCATION

MODELED NOISE RECEPTORS

- IMPACTED, BENEFITTED
- IMPACTED, NOT BENEFITTED
- NOT IMPACTED, BENEFITTED
- NOT IMPACTED, NOT BENEFITTED

POTENTIAL BARRIERS

- BARRIER FEASIBLE NOT REASONABLE
- BARRIER NOT FEASIBLE
- BARRIER FEASIBLE AND REASONABLE
- EXISTING NOISE WALL



SKELLY and LOY, Inc.	May 2019	Figure 4B

I-83 NORTH YORK WIDENING PROJECT
S.R. 0083, SECTION 070

NOISE STUDY AREAS, NOISE RECEPTOR AND MITIGATION LOCATIONS

YORK COUNTY, PENNSYLVANIA

Job No.: R12-0516.006	11" X 17" : 1" = 300'

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N

NSA 04

NSA 03

3-01 3-02 3-03 3-04 3-05 3-06 3-07 3-08 3-09 TMS-3-2

4-01 4-02 4-03 4-04 4-05 3-10 3-11 3-12 3-13 3-14 3-15 3-16 3-17

WHITEFORD ROAD

11TH AVENUE

10TH AVENUE

EBERTS LANE

N SHERMAN STREET

GRAHAM STREET

0 150 300 600 Feet

Legend

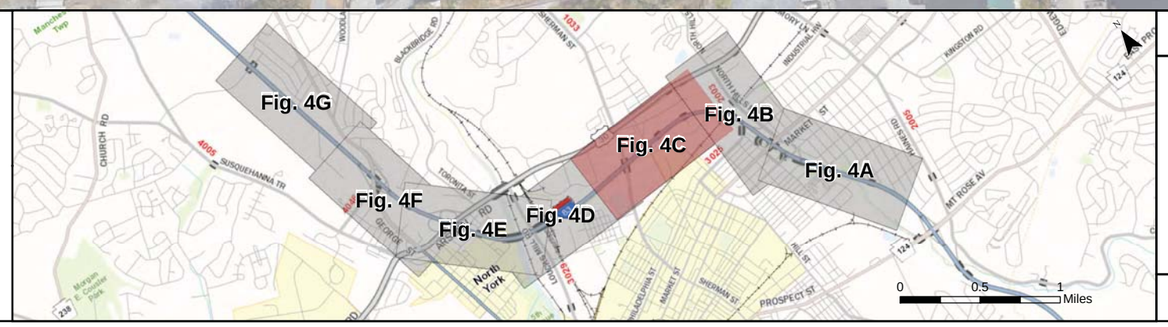
- PROPOSED EDGE OF SHOULDER
- 500' BUFFER
- NOISE STUDY AREAS
- MAINLINE CENTERLINE
- DISPLACED BUILDINGS
- PAVEMENT REMOVAL
- BRIDGE DECKING
- NOISE MEASUREMENT LOCATION

MODELED NOISE RECEPTORS

- IMPACTED, BENEFITTED
- IMPACTED, NOT BENEFITTED
- NOT IMPACTED, BENEFITTED
- NOT IMPACTED, NOT BENEFITTED

POTENTIAL BARRIERS

- BARRIER FEASIBLE NOT REASONABLE
- BARRIER NOT FEASIBLE
- BARRIER FEASIBLE AND REASONABLE
- EXISTING NOISE WALL



SKELLY and LOY, Inc. | May 2019 | Figure 4C

I-83 NORTH YORK WIDENING PROJECT
S.R. 0083, SECTION 070

NOISE STUDY AREAS, NOISE RECEPTOR AND MITIGATION LOCATIONS

YORK COUNTY, PENNSYLVANIA

Job No.: R12-0516.006 | 11" X 17" : 1" = 300'

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N

NSA 12

NSA 13

LOUCKS MILL ROAD

EDEN ROAD

PLUM STREET

13-01

13-02

13-03

E 6TH AVENUE

WINDSOR STREET

N BROAD STREET

N STATE STREET

RIDGE AVENUE

OLIVE STREET

N FRANKLIN STREET

N SHERMAN STREET

83

0 150 300 600 Feet

Legend

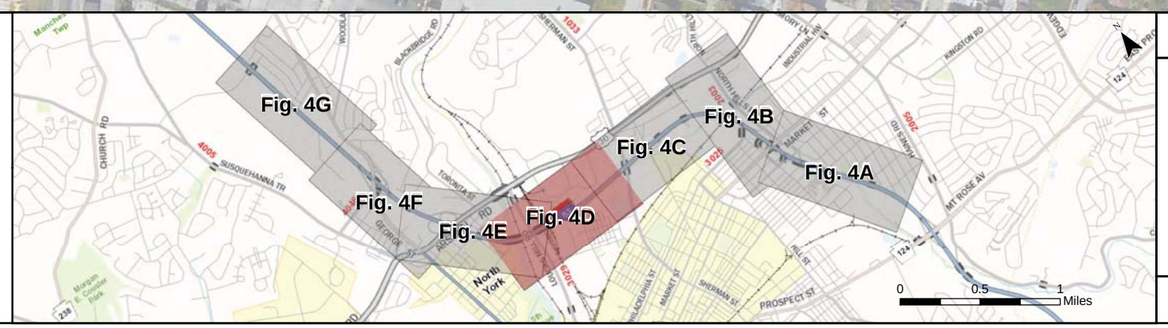
- PROPOSED EDGE OF SHOULDER
- 500' BUFFER
- NOISE STUDY AREAS
- MAINLINE CENTERLINE
- DISPLACED BUILDINGS
- PAVEMENT REMOVAL
- BRIDGE DECKING
- NOISE MEASUREMENT LOCATION

MODELED NOISE RECEPTORS

- IMPACTED, BENEFITTED
- IMPACTED, NOT BENEFITTED
- NOT IMPACTED, BENEFITTED
- NOT IMPACTED, NOT BENEFITTED

POTENTIAL BARRIERS

- BARRIER FEASIBLE NOT REASONABLE
- BARRIER NOT FEASIBLE
- BARRIER FEASIBLE AND REASONABLE
- EXISTING NOISE WALL



SKELLY and LOY, Inc.	May 2019	Figure 4D

I-83 NORTH YORK WIDENING PROJECT
S.R. 0083, SECTION 070

NOISE STUDY AREAS, NOISE RECEPTOR AND MITIGATION LOCATIONS

YORK COUNTY, PENNSYLVANIA

Job No.: R12-0516.006	11" X 17" : 1" = 300'

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N

NSA 07

NSA 06

NSA 05

NSA 10

NSA 09

NSA 12

TORONITA STREET

SAN CARLOS STREET

LOUCKS MILL ROAD

N QUEEN STREET

COLUMBIA AVENUE

WILSON AVENUE

E 11TH AVENUE

E 10TH AVENUE

HOWARD AVENUE

QUEEN STREET

N GEORGE STREET

N DUKE STREET

N COURT AVE

E 7TH AVENUE

E 6TH AVENUE

TMS 2-3

TMS 2-2

6-01

6-02

6-03

6-04

6-05

6-06

6-07

6-08

6-09

5-01

10-01

10-02

10-03

10-04

10-05

10-06

10-07

10-08

10-09

10-10

9-16

12-01

30

83

0 150 300 600 Feet

Legend

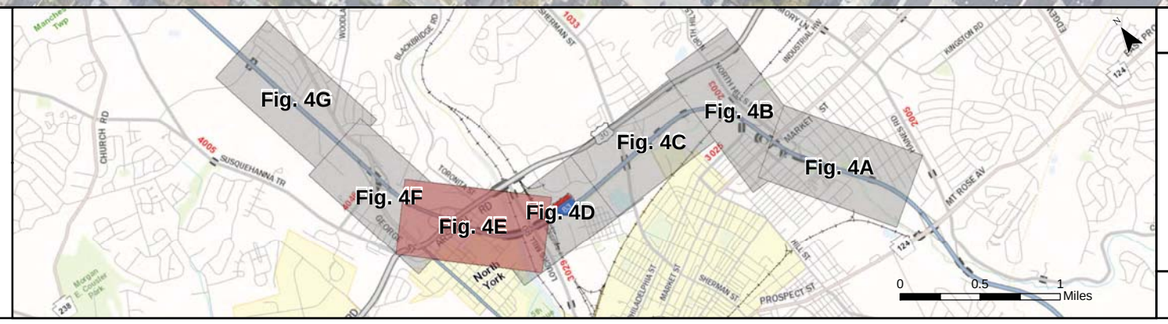
- PROPOSED EDGE OF SHOULDER
- 500' BUFFER
- NOISE STUDY AREAS
- MAINLINE CENTERLINE
- DISPLACED BUILDINGS
- PAVEMENT REMOVAL
- BRIDGE DECKING
- NOISE MEASUREMENT LOCATION

MODELED NOISE RECEPTORS

- IMPACTED, BENEFITTED
- IMPACTED, NOT BENEFITTED
- NOT IMPACTED, BENEFITTED
- NOT IMPACTED, NOT BENEFITTED

POTENTIAL BARRIERS

- BARRIER FEASIBLE NOT REASONABLE
- BARRIER NOT FEASIBLE
- BARRIER FEASIBLE AND REASONABLE
- EXISTING NOISE WALL



SKELLY and LOY, Inc. | May 2019 | Figure 4E

I-83 NORTH YORK WIDENING PROJECT
S.R. 0083, SECTION 070

NOISE STUDY AREAS, NOISE RECEPTOR AND MITIGATION LOCATIONS

YORK COUNTY, PENNSYLVANIA

Job No.: R12-0516.006 | 11" X 17" : 1" = 300'

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Document Path: Z:\R12-0516\NSA Mapping.mxd

N

MASONIC DRIVE

N POINT DRIVE

N GEORGE STREET

W 11TH AVENUE

LIGHTNER ROAD

WOODLAND AVENUE

HEIDELBERG AVE

N BEAVER STREET

TAFT AVENUE

WILSON AVENUE

NSA 08

NSA 07

NSA 06

NSA 10

NSA 09

8-01

7-01 7-02 7-03 7-04 7-05 TMS-2-1

6-01 TMS 2-2 6-02 6-03 6-04 6-05 6-06 TMS 2-3 6-07 6-08 6-09

10-01 10-02 10-03 10-04 10-05 10-06 10-07 10-08 10-09 10-10

9-01 9-02 9-03 9-04 9-05 9-06 9-07 9-08 9-09 9-10 9-11 9-12 9-13 9-14 9-15 9-16

0 150 300 600 Feet

Legend

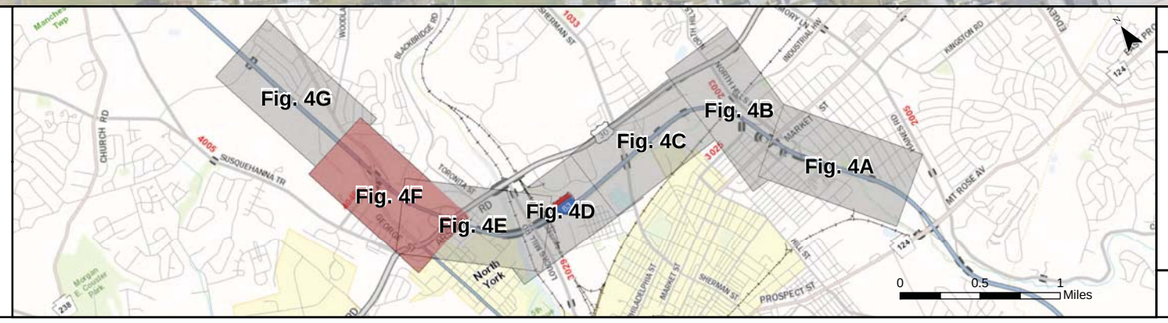
- PROPOSED EDGE OF SHOULDER
- 500' BUFFER
- NOISE STUDY AREAS
- MAINLINE CENTERLINE
- DISPLACED BUILDINGS
- PAVEMENT REMOVAL
- BRIDGE DECKING
- NOISE MEASUREMENT LOCATION

MODELED NOISE RECEPTORS

- IMPACTED, BENEFITTED
- IMPACTED, NOT BENEFITTED
- NOT IMPACTED, BENEFITTED
- NOT IMPACTED, NOT BENEFITTED

POTENTIAL BARRIERS

- BARRIER FEASIBLE NOT REASONABLE
- BARRIER NOT FEASIBLE
- BARRIER FEASIBLE AND REASONABLE
- EXISTING NOISE WALL



SKELLY and LOY, Inc.	May 2019	Figure 4F

I-83 NORTH YORK WIDENING PROJECT
S.R. 0083, SECTION 070

NOISE STUDY AREAS, NOISE RECEPTOR AND MITIGATION LOCATIONS

YORK COUNTY, PENNSYLVANIA

Job No.: R12-0516.006	11" X 17" : 1" = 300'

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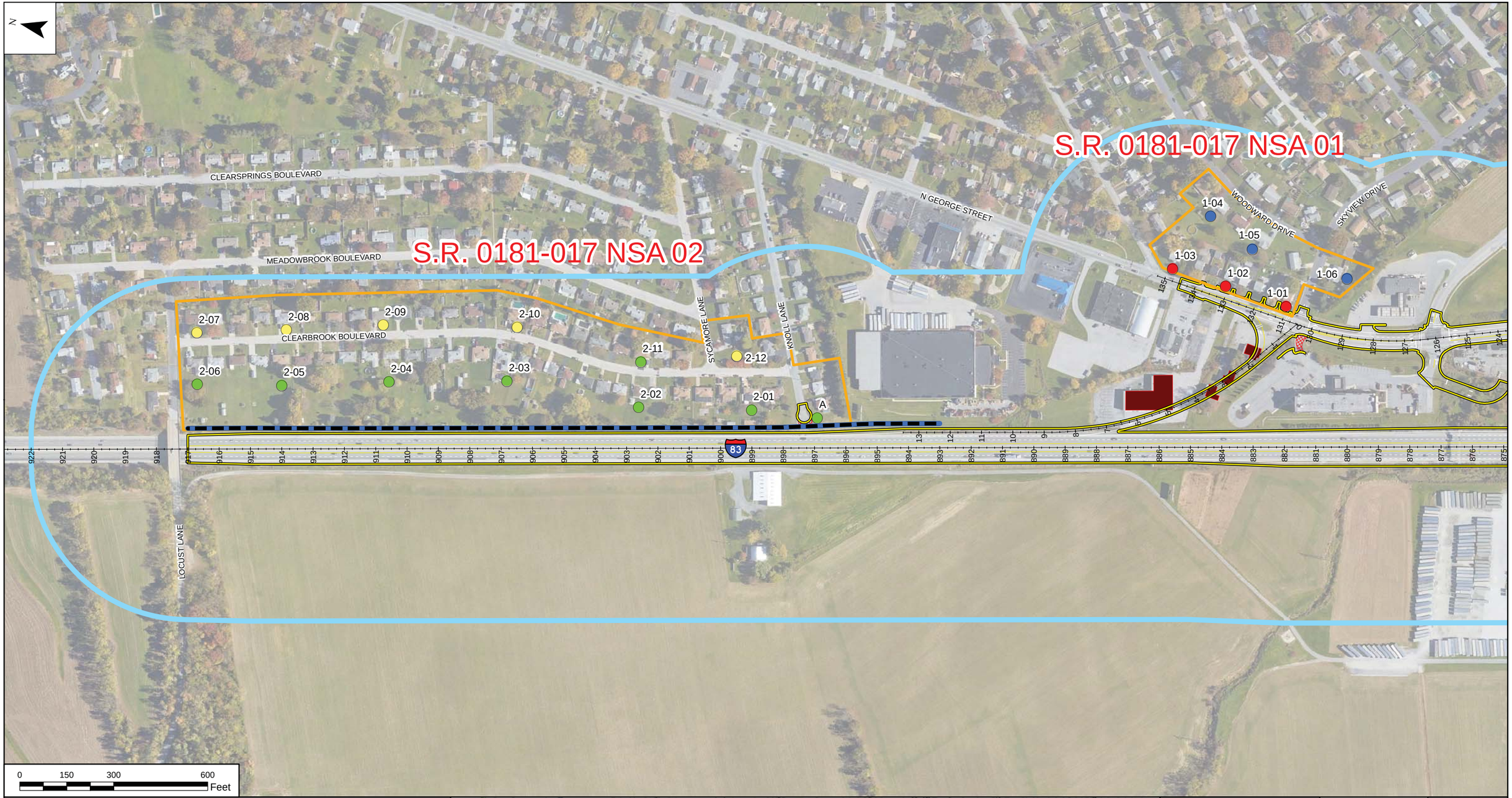


Legend

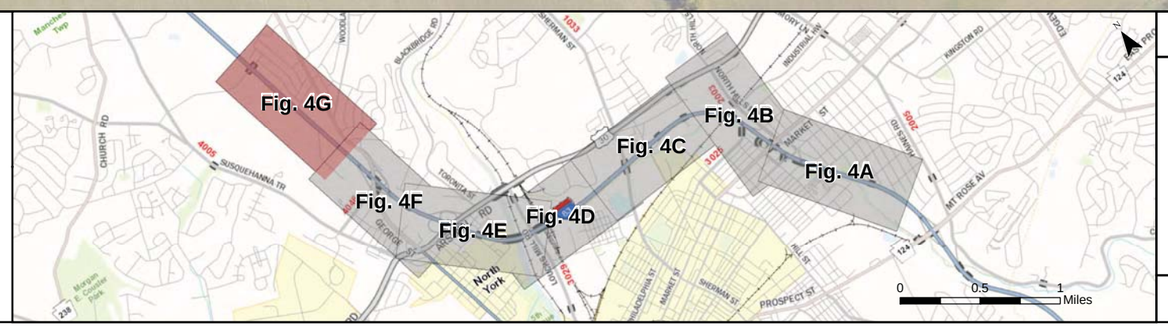
- PROPOSED EDGE OF SHOULDER
- 500' BUFFER
- NOISE STUDY AREAS
- MAINLINE CENTERLINE
- DISPLACED BUILDINGS
- PAVEMENT REMOVAL
- BRIDGE DECKING
- NOISE MEASUREMENT LOCATION

MODELED NOISE RECEPTORS

- IMPACTED, BENEFITTED
- IMPACTED, NOT BENEFITTED
- NOT IMPACTED, BENEFITTED
- NOT IMPACTED, NOT BENEFITTED

POTENTIAL BARRIERS

- BARRIER FEASIBLE NOT REASONABLE
- BARRIER NOT FEASIBLE
- BARRIER FEASIBLE AND REASONABLE
- EXISTING NOISE WALL



SKELLY and LOY, Inc.	May 2019	Figure 4G

I-83 NORTH YORK WIDENING PROJECT
S.R. 0083, SECTION 070

NOISE STUDY AREAS, NOISE RECEPTOR AND MITIGATION LOCATIONS

YORK COUNTY, PENNSYLVANIA

Job No.: R12-0516.006	11" X 17" : 1" = 300'

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TABLE IV-2
NOISE MODEL VALIDATION

NOISE STUDY AREA	SITE ID	MONITORED NOISE LEVEL (DBA)	CALCULATED NOISE LEVEL (DBA)	DIFFERENCE (DBA)
01	TMS 5-1	67.3	68.5	1.2
	TMS 5-2	69.7	67.3	-2.4
	TMS 5-3	64.3	64.1	-0.2
	TMS 5-6	66.5	65.0	-1.5
02	TMS 4-3	66.5	67.9	1.4
	TMS 4-6	63.7	61.6	-2.1
03	TMS 3-2	67.8	66.0	-1.8
06	TMS 2-2	66.0	68.0	2.0
	TMS 2-3	67.7	65.8	-1.9
07	TMS 2-1	63.7	63.7	0.0
14	TMS 4-1	65.4	63.3	-2.1
	TMS 4-2	62.2	62.6	0.4
16	TMS 6-1	65.6	64.2	-1.4
	TMS 6-2	66.3	67.4	1.1

C. NOISE STUDY AREA DETERMINATION

A noise study area (NSA) is defined as a group of receptors that are exposed to similar noise sources and levels; traffic volumes, traffic mix, and speed; and topographic features. There are 15 distinct geographic areas within the project area containing noise-sensitive land uses within 500 feet of the construction limits that can be considered similar in acoustical environment. Prior to completion of the noise analysis, a 16th NSA (NSA 11) was included in the study. As this NSA was discovered to be an unpermitted proposed residential development, it was removed from the discussion of developed land uses and is now addressed in the discussion of undeveloped land in Section VIII. Figures 4A through 4G present each of the NSAs within the project area.

D. TRAFFIC DATA FOR NOISE PREDICTION

For calculation of the existing loudest-hour noise levels within each NSA, additional noise receptor locations are modeled to provide a comprehensive basis of comparison for the analysis of noise impacts from the existing and future project conditions. Using the appropriate loudest-

hour traffic data, existing and future traffic noise levels were predicted for the measurement sites and the additional receptor locations.

The traffic data used in the noise analysis must produce sound levels representative of the loudest hour of the day in the future design year. Traffic data including A.M. Peak Hour and P.M. Peak Hour volumes, truck percentages, critical turning movements, and speed limits for both the Current (2014) and the Design Year (2042) for all major roadways in the local network were supplied by Stantec, which was curated from the August 2014 I-83 North York Widening Study Traffic Report prepared by Whitman, Requardt & Associates, LLP.

A comparison of the A.M. Peak Hour and P.M. Peak Hour traffic data determined that P.M. Peak Hour traffic volumes were consistently higher for the majority of the I-83 mainline and ramps. As a result, the P.M. Peak Hour volumes were chosen for the analysis.

E. EXISTING CONDITIONS

The discussion of existing conditions that follows, as well as the design year impact determination and mitigation consideration in the following section, will be discussed for each NSA. Noise levels for all receptors are presented in Table V-1 (in Section V, immediately following the Existing Conditions discussion).

1. NSA 01

NSA 01 is located in the southern portion of the study area immediately east of and adjacent to the northbound lanes of I-83 and represents 151 single-family residences, Fayfield Park (four Equivalent Residential Units based on linear feet analysis), and York Church of Christ. Traffic noise levels of 67, 70, 64, and 67 dBA were monitored within NSA 01 at receptors TMS 5-1, TMS 5-2, TMS 5-3, and TMS 5-6. Existing traffic noise levels are predicted to exceed the FHWA/PennDOT NAC of 66 dBA, with existing P.M. peak hour traffic noise levels modeled between 53 and 71 dBA. Traffic from I-83 is the dominant source of noise within the existing acoustic environment of NSA 1, with partial contributions from East Market Street.

2. NSA 02

NSA 02 is located in the southern portion of the study area, east of the northbound lanes of I-83, east of and adjacent to North Hills Road, and north of and adjacent to S.R. 0462 (East Market Street). NSA 02 represents 73 single-family residences and Advent Lutheran Church. As

no exterior use was identified at Advent Lutheran Church, this parcel was evaluated as an Activity Category D land use and an interior noise level was predicted based on FHWA methodology. Based on the building type (brick), a 25-dBA noise reduction due to the exterior of the structure was applied to an exterior modeled noise level of 69 dBA, resulting in a predicted interior noise level of 44 dBA. Traffic noise levels of 67 and 64 dBA were monitored within NSA 02 at receptors TMS 4-3 and TMS 4-6, respectively. Existing traffic noise levels are predicted to exceed the FHWA/PennDOT NAC of 66 dBA, with existing P.M. peak hour traffic noise levels modeled between 55 and 72 dBA. Traffic from I-83 is the dominant source of noise within the existing acoustic environment of NSA 02, with partial contributions of traffic noise from North Hills Road and East Market Street.

3. NSA 03

NSA 03 is located in the south-central portion of the study area, north of the northbound lanes of I-83 and east of Eberts Lane. NSA 03 represents 31 single-family residences and Redeemed Christian Church of God along Eleventh Avenue. As no exterior use was identified at Redeemed Christian Church of God, this parcel was evaluated as an Activity Category D land use and an interior noise level was predicted based on FHWA methodology. Based on the building type (brick), a 25-dBA noise reduction due to the exterior of the structure was applied to an exterior modeled noise level of 65 dBA, resulting in a predicted interior noise level of 40 dBA. A traffic noise level of 68 dBA was monitored within NSA 03 at receptor TMS 3-02. Existing traffic noise levels are predicted to exceed the FHWA/PennDOT NAC of 66 dBA, with existing P.M. peak hour traffic noise levels modeled between 56 and 66 dBA. Traffic from I-83 is the dominant source of noise within the existing acoustic environment of NSA 03.

4. NSA 04

NSA 04 is located in the south-central portion of the study area, north of the northbound lanes of I-83 and west of Eberts Lane. NSA 04 represents seven single-family residences along 10th Avenue. Existing traffic noise levels are not predicted to exceed the FHWA/PennDOT NAC of 66 dBA, with an existing P.M. peak hour traffic noise level modeled between 56 and 63 dBA. Traffic from I-83 is the dominant source of noise within the existing acoustic environment of NSA 04.

5. NSA 05

NSA 05 represents Tru by Hilton Hotel at 1520 Toronita Street. Existing traffic noise levels are not predicted to exceed the FHWA/PennDOT NAC of 71 dBA, with existing P.M. peak hour traffic noise levels modeled at 65 dBA. Traffic from I-83 is the dominant source of noise within the existing acoustic environment of NSA 05.

6. NSA 06

NSA 06 represents the Econo Lodge hotel and Jalaram Temple located in the north central portion of the study area, immediately east of the northbound Ramp W to I-83. As no exterior use was identified at Jalaram Temple, this parcel was evaluated as an Activity Category D land use and an interior noise level was predicted based on FHWA methodology. Based on the building type (brick), a 25-dBA noise reduction due to the exterior of the structure was applied to an exterior modeled noise level of 67 dBA, resulting in a predicted interior noise level of 42 dBA. Traffic noise levels of 66 and 68 dBA were monitored within NSA 06 at receptors TMS 2-2 and TMS 2-3, respectively. Existing traffic noise levels are not predicted to exceed the FHWA/PennDOT NAC of 71 dBA, with an existing P.M. peak hour traffic noise level modeled between 64 and 67 dBA. Traffic from I-83 is the dominant source of noise within the existing acoustic environment of NSA 06.

7. NSA 07

NSA 07 represents a group of 12 residential townhouses along North Point Drive east of the northbound lanes of I-83. A traffic noise level of 64 dBA was monitored within NSA 07 at receptor TMS 2-1. Existing traffic noise levels are not predicted to exceed the FHWA/PennDOT NAC of 66 dBA, with existing P.M. peak hour traffic noise levels modeled between 54 and 60 dBA. Traffic from I-83 is the dominant source of noise within the existing acoustic environment of NSA 07.

8. NSA 08

NSA 08 represents the Homewood Suites Hotel pool located in the northern portion of the study area, east of the northbound lanes of North George Street. Existing traffic noise levels are not predicted to exceed the FHWA/PennDOT NAC of 66 dBA, with existing P.M. peak hour traffic

noise levels modeled to be 62 dBA. Traffic from I-83 is the dominant source of noise within the existing acoustic environment of NSA 08, with partial contributions of traffic noise from North George Street.

9. NSA 09

NSA 09 is located in the northern portion of the study area, immediately west of and adjacent to the southbound lanes of North George Street, west of I-83. It is comprised of 16 single-family residences along North George Street, Lightner Road, Woodland Avenue, Heidelberg Avenue, North Beaver Street, and Wilson Avenue and includes the National Register of Historic Places Eligible Sycamore Hill property. Existing traffic noise levels are predicted to exceed the FHWA/PennDOT NAC of 66 dBA, with existing P.M. peak hour traffic noise levels modeled between 54 and 70 dBA. Traffic from North George Street is the dominant source of noise within the existing acoustic environment of NSA 09, with partial contributions of traffic noise from I-83.

10. NSA 10

NSA 10 represents ten single-family residences located along North George Street and Frelen Road immediately east of North George Street and west of the southbound lanes of I-83. Existing traffic noise levels are predicted to exceed the FHWA/PennDOT NAC of 66 dBA, with existing P.M. peak hour traffic noise levels modeled between 60 and 71 dBA. Traffic from North George Street and I-83 are the dominant sources of noise within the existing acoustic environment of NSA 10.

11. NSA 12

NSA 12 represents six single-family residences along Columbia Avenue, south of the southbound lanes of I-83. Existing traffic noise levels are not predicted to exceed the FHWA/PennDOT NAC of 66 dBA, with existing P.M. peak hour traffic noise levels modeled at 62 dBA. Traffic from I-83 is the dominant source of noise within the existing acoustic environment of NSA 12.

12. NSA 13

NSA 13 represents six single-family residences along North State Street and Ridge Avenue immediately south of the southbound lanes of I-83. Each of the three noise receptors in NSA 13 represents a duplex structure. Existing traffic noise levels are not predicted to exceed the FHWA/PennDOT NAC of 66 dBA, with existing P.M. peak hour traffic noise levels modeled between 57 and 64 dBA. Traffic from I-83 is the dominant source of noise within the existing acoustic environment of NSA 13.

13. NSA 14

NSA 14 represents 23 single-family residences located along East Philadelphia Street, North Yale Street, and Wayne Avenue, west of the southbound lanes of I-83. Traffic noise levels of 65 and 62 dBA were monitored within NSA 14 at receptors TMS 4-1 and 4-2, respectively. Existing traffic noise levels are not predicted to exceed the FHWA/PennDOT NAC of 66 dBA, with an existing P.M. peak hour traffic noise levels modeled between 58 and 65 dBA. Traffic from I-83 and East Market Street are the dominant sources of noise within the existing acoustic environment of NSA 14, with a partial contribution of traffic noise from East Philadelphia Street.

14. NSA 15

NSA 15 represents 12 single-family residential properties and Belmont Theatre located in the southern portion of the study area along East Market Street, South Belmont Street, North Yale Street, and Elmwood Boulevard. As no exterior use was identified at Belmont Theatre, this parcel was evaluated as an Activity Category D land use and an interior noise level was predicted based on FHWA methodology. Based on the building type (brick), a 25-dBA noise reduction due to the exterior of the structure was applied to an exterior modeled noise level of 69 dBA, resulting in a predicted interior noise level of 44 dBA. Existing traffic noise levels are predicted to exceed the FHWA/PennDOT NAC of 66 dBA, with existing P.M. peak hour traffic noise levels modeled between 56 and 69 dBA. Traffic from I-83, East Market Street, and Elmwood Boulevard are the dominant sources of noise within the existing acoustic environment of NSA 15.

15. NSA 16

NSA 16 represents 31 single-family residential properties, the National Register of Historic Places Listed Elmwood Mansion, and Elmwood Park (four Equivalent Residential Units based on linear feet analysis) located in the southern portion of the study area along Elmwood Boulevard, 1st Avenue, Wheaton Street, 2nd Avenue, 3rd Avenue, and South Belmont Street, west of the southbound lanes of I-83, and south of Elmwood Boulevard. A traffic noise level of 66 dBA was monitored within NSA 16 at receptors TMS 6-1 and TMS 6-2. Existing traffic noise levels are predicted to exceed the FHWA/PennDOT NAC of 66 dBA, with existing P.M. peak hour traffic noise levels modeled between 56 and 70 dBA. Traffic from I-83 is the dominant source of noise within the existing acoustic environment of NSA 16, with contributions of traffic noise from Elmwood Boulevard and South Belmont Street.

V. DESIGN YEAR NOISE IMPACTS

V. DESIGN YEAR NOISE IMPACTS

The future design year models were constructed based on preliminary design engineering plans and projected design year (2042) traffic figures. The project consists of a reconstruction and widening of the roadway from two to three travel lanes in each direction, from approximately 1,950 feet north of the Mount Rose Avenue (Exit 18) interchange in the south to the Locust Lane overpass in the north. Within this approximate five-mile corridor, the Market Street (Exit 19) interchange, U.S. Route 30 (Exit 21) interchange, and North George Street (Exit 22) interchange will all be reconstructed. Along with the roadway widening and interchange reconstructions, the design also incorporates the construction of additional auxiliary lanes and overhead and mainline bridge replacements.

Along with these proposed roadway improvement designs, future terrain features were incorporated into these models to ensure the most accurate noise propagation paths possible. In addition to the 2042 Design Build noise models, 2042 No-Build noise models were constructed for comparison purposes. The 2042 No-Build noise levels were predicted by incorporating projected 2042 traffic volumes and compositions into the existing conditions noise model. Predicted noise levels for the existing year (2014) and design year (2042) Build and No-Build scenarios are presented in Table V-1. Impact determination for the design year is discussed below for each NSA.

TABLE V-1
DESIGN YEAR NOISE LEVELS [$L_{eq(h)}$ IN dBA]

NOISE STUDY AREA	RECEPTOR ID	ACTIVITY CATEGORY	NOISE ABATEMENT CRITERIA (DBA)[1]	P.M. PEAK HOUR MODELED NOISE LEVEL		
				2014	2042 NO-BUILD	2042 BUILD
NSA 01	01-01	B	66	**66**	**66**	**70**
	01-02	B	66	65	65	**69**
	01-03	B	66	62	62	65
	01-04	B	66	59	59	62
	01-05	B	66	65	65	**69**
	01-06	B	66	60	60	64
	01-07	B	66	58	59	62
	01-08	B	66	64	65	**69**
	01-09	B	66	60	60	64
	01-10	B	66	58	59	62

TABLE V-1
(CONTINUED)

NOISE STUDY AREA	RECEPTOR ID	ACTIVITY CATEGORY	NOISE ABATEMENT CRITERIA (DBA)[1]	P.M. PEAK HOUR MODELED NOISE LEVEL		
				2014	2042 NO-BUILD	2042 BUILD
NSA 01 (continued)	01-11	B	66	65	66	70
	01-12	B	66	66	66	71
	01-13	B	66	62	63	67
	01-14	B	66	60	61	65
	01-15	B	66	59	59	63
	01-16	B	66	66	66	71
	01-17	B	66	63	64	69
	01-18	B	66	61	61	66
	01-19	B	66	58	59	63
	01-20	B	66	65	66	71
	01-21	B	66	62	63	68
	01-22	B	66	58	59	62
	01-23	B	66	70	71	76
	01-24	B	66	63	64	69
	01-25	B	66	61	62	66
	01-26	B	66	66	66	72
	01-27	B	66	63	64	69
	01-28	B	66	60	60	65
	01-29	B	66	58	58	62
	01-30	B	66	66	66	71
	01-31	B	66	61	62	67
	01-32	B	66	60	61	65
	01-33	B	66	58	58	62
	01-34	B	66	69	70	75
	01-35	B	66	67	67	72
	01-36	B	66	65	65	70
	01-37	B	66	62	63	66
	01-38	C	66	70	70	75
	01-39	B	66	64	65	69
	01-40	C	66	70	71	75
	01-41	B	66	62	63	67

TABLE V-1
(CONTINUED)

NOISE STUDY AREA	RECEPTOR ID	ACTIVITY CATEGORY	NOISE ABATEMENT CRITERIA (DBA)[1]	P.M. PEAK HOUR MODELED NOISE LEVEL		
				2014	2042 NO-BUILD	2042 BUILD
NSA 01 (continued)	01-42	B	66	59	59	63
	01-43	B	66	57	58	61
	01-44	C	66	**69**	**70**	**74**
	01-45	B	66	64	65	**69**
	01-46	B	66	60	61	64
	01-47	B	66	62	62	**66**
	01-48	C	66	**67**	**67**	**72**
	01-49	B	66	64	65	**69**
	01-50	B	66	63	63	**68**
	01-51	B	66	58	59	62
	01-52	B	66	**66**	**67**	**72**
	01-53	B	66	62	62	**66**
	01-54	B	66	59	59	63
	01-55	B	66	56	57	60
	01-56	B	66	**70**	**71**	**75**
	01-57	B	66	64	65	**69**
	01-58	B	66	60	61	64
	01-59	B	66	57	58	61
	01-60	B	66	**71**	**72**	**75**
	01-61	B	66	**67**	**68**	**72**
	01-62	B	66	63	64	**68**
	01-63	B	66	55	56	59
	01-64	B	66	**70**	**71**	**75**
	01-65	B	66	**66**	**67**	**71**
	01-66	B	66	60	61	64
	01-67	B	66	57	58	61
	01-68	B	66	**71**	**73**	**76**
	01-69	B	66	64	65	**68**
	01-70	B	66	56	57	60
	01-71	B	66	**66**	**67**	**71**
	01-72	B	66	61	62	65

TABLE V-1
(CONTINUED)

NOISE STUDY AREA	RECEPTOR ID	ACTIVITY CATEGORY	NOISE ABATEMENT CRITERIA (DBA)[1]	P.M. PEAK HOUR MODELED NOISE LEVEL		
				2014	2042 NO-BUILD	2042 BUILD
NSA 01 (continued)	01-73	B	66	56	57	60
	01-74	B	66	53	54	56
	01-75	B	66	**68**	**69**	**72**
	01-76	B	66	62	63	**67**
	01-77	B	66	53	54	55
	01-78	B	66	63	64	**67**
	01-79	B	66	58	59	62
	01-80	B	66	55	56	58
	01-81	B	66	62	63	65
	01-82	B	66	60	61	63
	01-83	B	66	56	57	59
NSA 02	02-01	B	66	65	65	**66**
	02-02	B	66	63	63	64
	02-03	B	66	61	62	64
	02-04	B	66	59	59	61
	02-05	B	66	**66**	**66**	**67**
	02-06	B	66	64	64	**66**
	02-07	B	66	61	62	65
	02-08	B	66	57	57	60
	02-09	B	66	**66**	**66**	**67**
	02-10	B	66	62	63	**66**
	02-11	B	66	58	58	61
	02-12	B	66	55	56	58
	02-13	B	66	**67**	**67**	**68**
	02-14	B	66	63	64	**67**
	02-15	B	66	**67**	**67**	**68**
	02-16	B	66	64	64	**67**
	02-17	B	66	60	60	63
	02-18	B	66	58	58	60
	02-19	B	66	**69**	**69**	**70**
	02-20	B	66	63	63	**66**

TABLE V-1
(CONTINUED)

NOISE STUDY AREA	RECEPTOR ID	ACTIVITY CATEGORY	NOISE ABATEMENT CRITERIA (DBA)[1]	P.M. PEAK HOUR MODELED NOISE LEVEL		
				2014	2042 NO-BUILD	2042 BUILD
NSA 02 (continued)	02-21	B	66	59	59	61
	02-22	B	66	**69**	**70**	**71**
	02-23	B	66	58	58	61
	02-24	B	66	57	57	59
	02-25	B	66	**72**	**72**	**72**
	02-26	D[2]	51	40	40	42
	02-27	B	66	60	60	62
	02-28	B	66	59	60	62
	02-29	B	66	59	59	60
	02-30	D[2]	51	43	44	46
	02-31	D[2]	51	44	44	46
	02-32	B	66	**70**	**70**	**71**
	02-33	B	66	**70**	**70**	**71**
NSA 03	03-01	B	66	**66**	**67**	**71**
	03-02	B	66	65	**66**	**70**
	03-03	B	66	63	64	**69**
	03-04	B	66	64	65	**69**
	03-05	B	66	65	**66**	**69**
	03-06	B	66	65	**66**	**68**
	03-07	B	66	65	**66**	**68**
	03-08	B	66	65	**66**	**68**
	03-09	D[2]	51	40	41	43
	03-10	B	66	59	60	63
	03-11	B	66	56	57	60
	03-12	B	66	59	60	63
	03-13	B	66	59	60	64
	03-14	B	66	57	57	60
	03-15	B	66	59	59	61
	03-16	B	66	57	58	60
	03-17	B	66	59	59	62

TABLE V-1
(CONTINUED)

NOISE STUDY AREA	RECEPTOR ID	ACTIVITY CATEGORY	NOISE ABATEMENT CRITERIA (DBA)[1]	P.M. PEAK HOUR MODELED NOISE LEVEL		
				2014	2042 NO-BUILD	2042 BUILD
NSA 04	04-01	B	66	56	56	58
	04-02	B	66	59	59	61
	04-03	B	66	57	58	61
	04-04	B	66	60	61	63
	04-05	B	66	63	64	**67**
NSA 05	05-01	E	71	65	66	67
NSA 06	06-01	D[2]	51	42	43	46
	06-02	E	71	66	**67**	70
	06-03	E	71	67	**67**	70
	06-04	E	71	65	**66**	68
	06-05	E	71	66	**67**	69
	06-06	E	71	64	65	67
	06-07	E	71	67	**68**	69
	06-08	E	71	67	**68**	69
	06-09	E	71	67	**68**	69
NSA 07	07-01	B	66	60	60	65
	07-02	B	66	57	58	63
	07-03	B	66	54	54	60
	07-04	B	66	59	60	64
	07-05	B	66	60	61	64
NSA 08	08-01	E	71	62	62	65
NSA 09	09-01	B	66	64	64	64
	09-02	B	66	65	65	**66**
	09-03	B	66	59	60	62
	09-04	B	66	63	63	64
	09-05	B	66	**70**	**70**	**69**
	09-06	B	66	**67**	**67**	**68**
	09-07	B	66	58	58	60
	09-08	B	66	64	65	**66**
	09-09	B	66	57	58	60
	09-10	B	66	54	54	57

TABLE V-1
(CONTINUED)

NOISE STUDY AREA	RECEPTOR ID	ACTIVITY CATEGORY	NOISE ABATEMENT CRITERIA (DBA)[1]	P.M. PEAK HOUR MODELED NOISE LEVEL		
				2014	2042 NO-BUILD	2042 BUILD
NSA 09 (continued)	09-11	B	66	57	57	59
	09-12	B	66	58	58	59
	09-13	B	66	61	61	61
	09-14	B	66	63	63	64
	09-15	B	66	59	59	60
	09-16	B	66	58	58	59
NSA 10	10-01	B	66	63	63	**68**
	10-02	B	66	63	63	**67**
	10-03	B	66	64	64	**68**
	10-04	B	66	**71**	**71**	**71**
	10-05	B	66	61	62	62
	10-06	B	66	60	61	62
	10-07	B	66	63	64	**66**
	10-08	B	66	60	61	62
	10-09	B	66	60	61	61
	10-10	B	66	60	60	61
NSA 12	12-01	B	66	62	63	64
NSA 13	13-01	B	66	64	65	**67**
	13-02	B	66	58	59	61
	13-03	B	66	57	58	61
NSA 14	14-01	B	66	59	59	62
	14-02	B	66	60	60	63
	14-03	B	66	60	61	63
	14-04	B	66	61	61	64
	14-05	B	66	62	62	65
	14-06	B	66	61	61	63
	14-07	B	66	62	63	65
	14-08	B	66	65	65	**66**
	14-09	B	66	58	59	61
	14-10	B	66	60	61	63
	14-11	B	66	63	64	65

TABLE V-1
(CONTINUED)

NOISE STUDY AREA	RECEPTOR ID	ACTIVITY CATEGORY	NOISE ABATEMENT CRITERIA (DBA)[1]	P.M. PEAK HOUR MODELED NOISE LEVEL		
				2014	2042 NO-BUILD	2042 BUILD
NSA 14 (continued)	14-12	B	66	64	64	65
	14-13	B	66	64	64	**66**
	14-14	B	66	58	58	60
	14-15	B	66	59	60	61
	14-16	B	66	63	63	64
	14-17	B	66	62	63	65
	14-18	B	66	63	64	**66**
NSA 15	15-01	B	66	**68**	**68**	**69**
	15-02	B	66	58	59	59
	15-03	B	66	**66**	**66**	65
	15-04	B	66	58	59	59
	15-05	D[2]	51	44	44	43
	15-06	B	66	56	57	59
	15-07	B	66	57	58	59
	15-08	B	66	58	59	60
	15-09	B	66	61	61	62
	15-10	B	66	65	**66**	65
NSA 16	16-01	B	66	58	59	61
	16-02	B	66	59	60	62
	16-03	B	66	61	61	63
	16-04	B	66	63	64	64
	16-05	B	66	**68**	**68**	**68**
	16-06	B	66	62	63	63
	16-07	B	66	56	57	58
	16-08	B	66	57	58	59
	16-09	B	66	59	60	61
	16-10	B	66	62	63	63
	16-11	B	66	65	**66**	**66**
	16-12	B	66	**67**	**68**	**67**
	16-13	B	66	57	58	59
	16-14	B	66	61	61	62

TABLE V-1
(CONTINUED)

NOISE STUDY AREA	RECEPTOR ID	ACTIVITY CATEGORY	NOISE ABATEMENT CRITERIA (DBA)[1]	P.M. PEAK HOUR MODELED NOISE LEVEL		
				2014	2042 NO-BUILD	2042 BUILD
NSA 16 (continued)	16-15	B	66	61	61	62
	16-16	B	66	61	62	63
	16-17	B	66	64	64	65
	16-18	B	66	**68**	**69**	**68**
	16-19	B	66	61	61	63
	16-20	B	66	62	62	64
	16-21	B	66	62	63	64
	16-22	B	66	64	65	**66**
	16-23	B	66	**66**	**66**	**66**
	16-24	B	66	**69**	**70**	**69**
	16-25	B	66	62	62	64
	16-26	B	66	63	64	65
	16-27	B	66	**66**	**66**	**67**
	16-28	B	66	61	62	64
	16-29	B	66	62	63	64
	16-30	B	66	64	65	**66**
	16-31	C	66	**70**	**71**	**70**
	16-32	C	66	**70**	**70**	**70**
	16-33	C	66	**66**	**67**	**68**
	16-34	C	66	**69**	**70**	**69**

Red font denotes impacted sound level.
1 NAC level in table represents the approach value, which is 1 dBA below the actual NAC.
2 Category D noise levels predicted using FHWA methodology and include a -25-dBA noise reduction due to structures' exterior.

A. NSA 01

Design year (2042) traffic noise levels at 81 residential properties and Fayfield Park (represented by four equivalent residential units) within NSA 01 are predicted to exceed the FHWA/PennDOT NAC of 66 dBA. An average increase of 4 dBA is predicted for the noise receptors within NSA 1. This increase in future traffic noise levels can be attributed to an increase in traffic volumes along I-83 as well as an alteration in the noise propagation path due to the

widening of the highway immediately adjacent to NSA 01. Future traffic noise levels within NSA 01 are predicted to range between 55 and 76 dBA. Noise abatement consideration is warranted for NSA 1.

B. NSA 02

Design year (2042) traffic noise levels at 36 residential properties within NSA 02 are predicted to exceed the FHWA/PennDOT NAC of 66 dBA. Ten residential properties along North Hills Road, between East Philadelphia Street and Wallace Street, will be displaced. Design year traffic noise levels at Advent Lutheran Church (interior usage, represented by Receptors 2-26, 2-30, and 2-31) are not predicted to exceed the FHWA/PennDOT NAC of 51 dBA. An average increase of 2 dBA is predicted for the noise receptors within NSA 02. This increase in future traffic noise levels can be attributed to an increase in traffic volumes along I-83 and North Hills Road as well as an alteration in the noise propagation path due to the widening of the highway adjacent to NSA 02. Future traffic noise levels within NSA 02 are predicted to range between 58 and 72 dBA. Noise abatement consideration is warranted for NSA 02.

C. NSA 03

Design year (2042) traffic noise levels at 12 residential properties within NSA 03 are predicted to exceed the FHWA/PennDOT NAC of 66 dBA. The design year traffic noise level at Redeemed Christian Church of God (interior usage, represented by Receptor 3-09) is not predicted to exceed the FHWA/PennDOT NAC of 51 dBA. An average increase of 4 dBA is predicted for the noise receptors within NSA 03. This increase in future traffic noise levels can be attributed to an increase in traffic volumes along I-83 as well as an alteration in the noise propagation path due to the widening of the highway immediately adjacent to NSA 03. Future traffic noise levels within NSA 03 are predicted to range between 60 and 71 dBA. Noise abatement consideration is warranted for NSA 03.

D. NSA 04

The design year (2042) traffic noise level at one residential unit within NSA 04 is predicted to exceed the FHWA/PennDOT NAC of 66 dBA. An average increase of 3 dBA is predicted for the noise receptors within NSA 04. This increase in future traffic noise levels can be attributed to an increase in traffic volumes along I-83 as well as an alteration in the noise propagation path

due to the widening of the highway immediately adjacent to NSA 04. Future traffic noise levels within NSA 04 are predicted to range between 58 and 67 dBA. Noise abatement consideration is warranted for NSA 04.

E. NSA 05

The design year (2042) traffic noise level within NSA 05 is not predicted to exceed the FHWA/PennDOT NAC of 71 dBA. An increase of 2 dBA is predicted for the hotel's exterior usage area. This increase in the future traffic noise level can be attributed to an increase in traffic volumes along I-83 as well as an alteration in the noise propagation path due to the widening of the highway immediately adjacent to NSA 05. The future traffic noise level within NSA 05 is predicted to be 67 dBA. Noise abatement consideration is not warranted for NSA 05.

F. NSA 06

Design year (2042) traffic noise levels within NSA 06 are not predicted to exceed the FHWA/PennDOT NAC of 71 dBA. The design year traffic noise level at Jalaram Temple (interior usage, represented by Receptor 6-01) is not predicted to exceed the FHWA/PennDOT NAC of 51 dBA. An average increase of 3 dBA is predicted for the noise receptors within NSA 06. This increase in future traffic noise levels can be attributed to an increase in traffic volumes along I-83 as well as an alteration in the noise propagation path due to the widening of the highway adjacent to NSA 06. Future traffic noise levels within NSA 06 are predicted to range between 67 and 70 dBA. Noise abatement consideration is not warranted for NSA 06.

G. NSA 07

Design year (2042) traffic noise levels within NSA 07 are not predicted to exceed the FHWA/PennDOT NAC of 66 dBA. There are 12 front-row townhouses planned to be displaced based on the preferred alternative. An average increase of 5 dBA is predicted for the noise receptors within NSA 07. This increase in the future traffic noise level can be attributed to an increase in traffic volumes along I-83 as well as an alteration in the noise propagation path due to the widening of the highway immediately adjacent to NSA 07. Future traffic noise levels within NSA 07 are predicted to range between 60 and 65 dBA. Noise abatement consideration is not warranted for NSA 07.

H. NSA 08

The design year (2042) traffic noise level within NSA 08 is not predicted to exceed the FHWA/PennDOT NAC of 71 dBA. An increase of 3 dBA is predicted for the hotel's exterior usage area. This increase in the future traffic noise level can be attributed to an increase in traffic volumes along I-83 and North George Street as well as an alteration in the noise propagation path due to the widening of the highway adjacent to NSA 08. The future traffic noise level within NSA 08 is predicted to be 65 dBA. Noise abatement consideration is not warranted for NSA 08.

I. NSA 09

Design year (2042) traffic noise levels at four residential units within NSA are predicted to exceed the FHWA/PennDOT NAC of 66 dBA. An average increase of 2 dBA is predicted for the noise receptors within NSA 09. This increase in the future traffic noise level can be attributed to an increase in traffic volumes along I-83 and North George Street as well as an alteration in the noise propagation path due to the widening of the I-83, introduction of roundabouts, and reconstruction of North George Street. Future traffic noise levels within NSA 09 are predicted to range between 57 and 69 dBA. Noise abatement consideration is warranted for NSA 09.

J. NSA 10

Design year (2042) traffic noise levels at five residential properties within NSA 10 are predicted to exceed the FHWA/PennDOT NAC of 66 dBA. An average increase of 2 dBA is predicted for the noise receptors within NSA 10. This increase in the future traffic noise level can be attributed to an increase in traffic volumes along I-83 and North George Street as well as an alteration in the noise propagation path due to the widening of the I-83, introduction of roundabouts and new I-83 connecting ramps, and reconstruction of North George Street. Future traffic noise levels within NSA 10 are predicted to range between 61 and 71 dBA. Noise abatement consideration is warranted for NSA 10.

K. NSA 12

The design year (2042) traffic noise level within NSA 12 is not predicted to exceed the FHWA/PennDOT NAC of 66 dBA. An increase of 1 dBA is predicted for the noise receptor representing NSA 12. This increase in the future traffic noise level can be attributed to an increase

in traffic volumes along I-83 as well as an alteration in the noise propagation path due to the widening of I-83 along with the redesign and reconstruction of the U.S. 30 interchange. The future traffic noise level within NSA 12 is predicted to be 64 dBA. Noise abatement consideration is not warranted for NSA 12.

L. NSA 13

The design year (2042) traffic noise levels at two residential properties within NSA 13 are predicted to exceed the FHWA/PennDOT NAC of 66 dBA. An average increase of 3 dBA is predicted for the noise receptors within NSA 13. This increase in future traffic noise levels can be attributed to an increase in traffic volumes along I-83 as well as an alteration in the noise propagation path due to the widening of the highway immediately adjacent to NSA 13. Future traffic noise levels within NSA 13 are predicted to range between 61 and 67 dBA. Noise abatement consideration is warranted for NSA 13.

M. NSA 14

Design year (2042) traffic noise levels at three residential properties within NSA 14 are predicted to exceed the FHWA/PennDOT NAC of 66 dBA. An average increase of 2 dBA is predicted for the noise receptors within NSA 14. This increase in the future traffic noise level can be attributed to an increase in traffic volumes along I-83 and North Belmont Street as well as an alteration in the noise propagation path due to the widening of I-83 and the introduction of a new I-83 southbound exit ramp. Future traffic noise levels within NSA 14 are predicted to range between 60 and 66 dBA. Noise abatement consideration is warranted for NSA 14.

N. NSA 15

The design year (2042) traffic noise level at one residential property within NSA 15 is predicted to exceed the FHWA/PennDOT NAC of 66 dBA. The design year traffic noise level at the Belmont Theatre (interior usage, represented by Receptor 15-05) is not predicted to exceed the FHWA/PennDOT NAC of 51 dBA. An average increase of 1 dBA is predicted for the noise receptors within NSA 15. This increase in the future traffic noise level can be attributed to an increase in traffic volumes along I-83 and South Belmont Street as well as an alteration in the noise propagation path due to the widening of I-83 and the removal of an existing I-83 southbound

exit ramp. Future traffic noise levels within NSA 15 are predicted to range between 59 and 69 dBA. Noise abatement consideration is warranted for NSA 15.

O. NSA 16

The design year (2042) traffic noise level at 13 residential properties within NSA 16 is predicted to exceed the FHWA/PennDOT NAC of 66 dBA. An average increase of 1 dBA is predicted for the noise receptors within NSA 16. This increase in the future traffic noise level can be attributed to an increase in traffic volumes along I-83 and South Belmont Street as well as an alteration in the noise propagation path due to the widening of I-83 and the removal of an existing I-83 southbound exit ramp. Future traffic noise levels within NSA 16 are predicted to range between 58 and 70 dBA. Noise abatement consideration is warranted for NSA 16.

VI. MITIGATION ALTERNATIVES AND CONSIDERATION

VI. MITIGATION ALTERNATIVES AND CONSIDERATION

Based on the impact evaluation discussed in the preceding section, noise abatement consideration is warranted for 10 of the 15 NSAs analyzed in the project corridor. This section of the document outlines the various preliminary abatement alternatives which were considered in an attempt to reduce noise levels at the receptors which warrant abatement considerations.

State and federal guidelines suggest a range of mitigation measures which should be considered. Although noise barriers or berms are the most common response to an identified impact, other approaches can be effective under certain circumstances. Traffic-control measures (e.g., speed restrictions, prohibitions for certain vehicle types during certain periods of the day), alteration of horizontal or vertical alignments, acquisition of land as a buffer, and soundproofing of public use or nonprofit institutional structures have been suggested as alternative abatement measures. Due to the nature of the I-83 corridor, these alternative abatement considerations are not feasible or practical. Traffic-control measures are not practical due to the high volume of vehicles using this roadway. Alignment modifications are not feasible due to right-of-way constraints, nor is the acquisition of land to act as a buffer since noise-sensitive land uses are located adjacent to the highway and therefore land to act as a buffer does not exist. The impacts have been predicted to largely affect private residences; therefore, soundproofing is not supported by the Department. Furthermore, soundproofing would not improve exterior conditions, so outdoor uses would not benefit.

For the I-83 widening project, noise barriers are the only practical method to reduce highway traffic noise levels. Noise barriers were evaluated to determine feasibility and reasonableness for nine of the ten NSAs warranting noise abatement consideration (NSAs 01, 02, 03, 04, 09, 10, 13, 14, 15, and 16). A noise barrier was unable to be evaluated for NSA 15 as noise barrier placement for NSA 15 is not feasible without prohibiting pedestrian access to multiple commercial properties located along East Market Street. Noise barriers were determined to be both feasible and reasonable for five NSAs (NSAs 01, 02, 03, 04, and 16). Noise barriers were determined to be feasible but not reasonable for NSAs 10, 13, and 14, and noise barriers were determined to be not feasible for NSAs 09 and 15. Table VI-1 presents a summary of the results of the barrier analyses. Individual discussions for each NSA warranting noise abatement consideration follow. All noise levels presented in Tables VI-2 through VI-9 have been rounded to the nearest whole number. Insertion losses were calculated prior to rounding, which results in minor discrepancies for several Insertion Loss values. Locations of all evaluated noise barriers are presented on Figures 4A through 4G.

TABLE VI-1
NOISE BARRIER ANALYSIS SUMMARY

NOISE STUDY AREA	NUMBER OF NOISE IMPACTS	NOISE BARRIER LENGTH (FT)	AVERAGE NOISE BARRIER HEIGHT (FT)	NOISE BARRIER AREA (FT^2)	NUMBER OF BENEFITING RESIDENCES	SF/BR (FT^2 PER BENEFITED RESIDENCE)	FEASIBLE/ REASONABLE
01	85	4,566	15.7	71,464	140	510	Yes / Yes
02	36	2,374	15	35,799	60	597	Yes / Yes
03 and 04	13	2,458	18	44,249	35	1,264	Yes / Yes
09	4	429	14	6,000	3	2,000	No / No*
10	5	864	16.2	13,960	3	4,653	Yes / No
13	2	1,816	14	25,420	6	4,237	Yes / No
14	3	720	20	14,400	3	4,800	Yes / No
16	13	2,231	16	35,688	24	1,487	Yes / Yes
NSA 02 (S.R. 0181-017)	36	2,182	17	37,096	56	662	Yes / Yes

* Although the evaluated abatement design for NSA 09 provides the required noise reductions and meets the SF/BR threshold, it was determined that a retaining wall would be required to construct a noise barrier at the proposed location. The additional cost to construct and maintain a retaining wall required solely to support a noise barrier was determined to be cost prohibitive, resulting in a not feasible determination for noise abatement.

A. NSA 01

Noise mitigation for NSA 01 incorporates a two-barrier system that effectively provides noise abatement to the entire community. Two noise barriers were evaluated between the northbound lanes of I-83 and the adjacent noise-impacted land uses of NSA 01 to determine noise abatement feasibility and reasonableness. A 3,568-foot-long, 16-foot-tall noise barrier was modeled along the edge of shoulder of northbound I-83 from Station 203+00 of I-83 to Station 15+30 of Ramp R. A second 998-foot-long, 15-foot-tall noise barrier was modeled along the edge of shoulder of northbound I-83 from Station 11+00 of Ramp Q to Station 21+00 of Ramp Q.

These two noise barriers, totaling 71,464 ft^2, provide the required noise reduction of ≥5 dBA for all 85 of the noise-impacted equivalent residential units and provides ≥5 dBA noise reduction at 55 non-impacted residences (see Table VI-2). This optimized noise barrier system benefits a total of 140 equivalent residential units and provides ≥7 dBA noise reduction at 77 residences, equating to 510 ft^2/benefitted receptor (BR), which is less than the 2,000 ft^2/BR reasonableness threshold specified by PennDOT guidance, resulting in a noise barrier that is both feasible and reasonable.

TABLE VI-2
NSA 01 NOISE BARRIER DATA

NOISE STUDY AREA	RECEPTOR ID	RESIDENTIAL UNITS REPRESENTED	2042 BUILD SOUND LEVEL		INSERTION LOSS FROM OPTIMIZED BARRIER (dBA)
			WITHOUT BARRIER (dBA)	WITH BARRIER (dBA)	
NSA 01	01-01	1	70	62	8
	01-02	1	69	61	8
	01-03	1	65	61	4
	01-04	2	62	57	4
	01-05	2	69	59	10
	01-06	2	64	58	6
	01-07	2	62	57	5
	01-08	2	69	59	9
	01-09	2	64	58	6
	01-10	2	62	57	5
	01-11	1	70	60	10
	01-12	2	71	61	10
	01-13	3	67	59	8
	01-14	2	65	58	7
	01-15	2	63	57	6
	01-16	2	71	61	10
	01-17	3	69	60	9
	01-18	3	66	57	9
	01-19	3	63	56	7
	01-20	2	71	61	11
	01-21	2	68	58	9
	01-22	2	62	55	7
	01-23	2	76	63	13
	01-24	1	69	59	10
	01-25	1	66	57	9
	01-26	2	72	61	11
	01-27	3	69	59	10
	01-28	3	65	56	9
	01-29	2	62	55	8
	01-30	2	71	60	11
	01-31	2	67	57	10

TABLE VI-2
(CONTINUED)

NOISE STUDY AREA	RECEPTOR ID	RESIDENTIAL UNITS REPRESENTED	2042 BUILD SOUND LEVEL		INSERTION LOSS FROM OPTIMIZED BARRIER (dBA)
			WITHOUT BARRIER (dBA)	WITH BARRIER (dBA)	
NSA 01 (continued)	01-32	2	65	56	9
	01-33	2	62	54	8
	01-34	1	**75**	63	12
	01-35	1	**72**	61	11
	01-36	1	**70**	60	10
	01-37	1	**66**	58	9
	01-38	1	**75**	62	12
	01-39	1	**69**	59	10
	01-40	1	**75**	62	12
	01-41	1	**67**	58	9
	01-42	2	63	56	7
	01-43	3	61	54	7
	01-44	1	**74**	62	12
	01-45	2	**69**	59	9
	01-46	3	64	56	8
	01-47	2	**66**	57	8
	01-48	1	**72**	61	11
	01-49	2	**69**	60	9
	01-50	1	**68**	59	8
	01-51	3	62	54	8
	01-52	2	**72**	61	11
	01-53	3	**66**	57	9
	01-54	2	63	55	8
	01-55	2	60	53	7
	01-56	2	**75**	63	13
	01-57	2	**69**	59	10
	01-58	2	64	55	9
	01-59	3	61	54	7
	01-60	1	**75**	63	13
	01-61	3	**72**	61	11
	01-62	2	**68**	58	10

TABLE VI-2
(CONTINUED)

NOISE STUDY AREA	RECEPTOR ID	RESIDENTIAL UNITS REPRESENTED	2042 BUILD SOUND LEVEL		INSERTION LOSS FROM OPTIMIZED BARRIER (dBA)
			WITHOUT BARRIER (dBA)	WITH BARRIER (dBA)	
NSA 01 (continued)	01-63	1	59	52	7
	01-64	1	**75**	62	12
	01-65	3	**71**	60	11
	01-66	2	64	56	9
	01-67	1	61	54	7
	01-68	2	**76**	63	13
	01-69	1	**68**	59	9
	01-70	1	60	54	6
	01-71	3	**71**	61	10
	01-72	2	65	57	8
	01-73	2	60	55	6
	01-74	1	56	52	4
	01-75	2	**72**	64	9
	01-76	2	**67**	59	7
	01-77	2	55	53	3
	01-78	2	**67**	62	5
	01-79	3	62	58	4
	01-80	2	58	54	4
	01-81	1	65	63	2
	01-82	1	63	60	4
	01-83	2	59	56	3

AVERAGE HEIGHT (FT)	LENGTH (FT)	SQUARE FEET	TOTAL BENEFITS	SQUARE FEET/ BENEFITS	FEASIBLE?/ REASONABLE?
15.7	4,566	71,464	140	510	YES / YES

B. NSA 02

Noise mitigation for NSA 02 incorporates a three-barrier system that effectively provides noise abatement to the majority of the community. Three noise barriers were evaluated between the northbound lanes of I-83 and the adjacent noise-impacted land uses of NSA 02 to determine

noise abatement feasibility and reasonableness. A 1,283-foot-long, 15-foot-tall noise barrier was modeled along the edge of shoulder of northbound I-83 from Station 21+00 of Ramp Q to Station 257+86 of I-83. A second (543-foot-long, 15-foot-tall) noise barrier was modeled along the North Hills Road northbound sidewalk between East Market Street and East Philadelphia Street. A third (548-foot-long, 15-foot-tall) noise barrier was modeled along the North Hills Road northbound sidewalk between East Philadelphia Street and Wallace Street. All three of these barriers are necessary to provide the most effective noise abatement for NSA 02 due to the high traffic volumes and truck percentages along North Hills Road.

These three noise barriers, totaling 35,799 ft^2, provide the required noise reduction of ≥5 dBA for 32 of the 36 noise-impacted equivalent residential units and provide ≥5 dBA noise reduction at 28 non-impacted residences (see Table VI-3). This optimized noise barrier system benefits a total of 60 equivalent residential units and provides ≥7 dBA noise reduction at 49 residences, equating to 597 ft^2/benefitted receptor (BR), which is less than the 2,000 ft^2/BR reasonableness threshold specified by PennDOT guidance, resulting in a noise barrier that is both feasible and reasonable.

Effective noise barriers were unable to be evaluated for the two impacted receptors identified along East Market Street (Receptors 2-32 and 2-33) and the impacted receptor along Wallace Street (Receptor 2-01) without prohibiting vehicular and pedestrian access to these residential properties due to the presence of driveways.

TABLE VI-3
NSA 02 NOISE BARRIER DATA

NOISE STUDY AREA	RECEPTOR ID	RESIDENTIAL UNITS REPRESENTED	2042 BUILD SOUND LEVEL		INSERTION LOSS FROM OPTIMIZED BARRIER (dBA)
			WITHOUT BARRIER (dBA)	WITH BARRIER (dBA)	
NSA 02	02-01	1	66	62	4
	02-02	1	64	58	6
	02-03	2	64	57	7
	02-04	3	61	54	7
	02-05	1	67	59	7
	02-06	3	66	58	8
	02-07	3	65	56	9
	02-08	3	60	53	7
	02-09	3	67	59	8

TABLE VI-3
(CONTINUED)

NOISE STUDY AREA	RECEPTOR ID	RESIDENTIAL UNITS REPRESENTED	2042 BUILD SOUND LEVEL		INSERTION LOSS FROM OPTIMIZED BARRIER (dBA)
			WITHOUT BARRIER (dBA)	WITH BARRIER (dBA)	
NSA 02 (continued)	02-10	3	66	57	9
	02-11	3	61	54	7
	02-12	3	58	53	6
	02-13	3	68	60	8
	02-14	3	67	58	9
	02-15	3	68	61	8
	02-16	3	67	58	9
	02-17	3	63	55	8
	02-18	3	60	54	6
	02-19	2	70	58	13
	02-20	3	66	57	9
	02-21	2	61	55	6
	02-22	2	71	58	13
	02-23	2	61	56	5
	02-24	2	59	55	3
	02-25	3	72	58	13
	02-26	0	42	35	7
	02-27	2	62	57	4
	02-28	3	62	58	4
	02-29	2	60	58	3
	02-30	0	46	43	2
	02-31	0	46	45	1
	02-32	1	71	70	1
	02-33	2	71	70	0

AVERAGE HEIGHT (FT)	LENGTH (FT)	SQUARE FEET	TOTAL BENEFITS	SQUARE FEET/ BENEFITS	FEASIBLE?/ REASONABLE?
15	2,374	35,799	60	597	YES / YES

C. NSA 03 AND NSA 04

NSA 03 and NSA 04 were evaluated together for noise abatement due to their geographic relationship. Noise mitigation for NSA 03 and NSA 04 incorporates a two-barrier system that effectively provides noise abatement to the entire community. Two noise barriers were evaluated between the northbound lanes of I-83 and the adjacent noise-impacted land uses of NSA 03 and NSA 04 to determine noise abatement feasibility and reasonableness. A 1,933-foot-long, 18-foot-tall noise barrier was modeled along the edge of shoulder of northbound I-83 from Station 13+00 of Ramp V to Station 289+21 of I-83. A second (525-foot-long, 18-foot-tall) noise barrier was modeled along the edge of shoulder of northbound I-83 from Station 289+72 of I-83 to Station 295+00 of I-83.

These two noise barriers, totaling 44,249 ft^2, provide the required noise reduction of ≥5 dBA for all 13 of the noise-impacted equivalent residential units and provide ≥5 dBA noise reduction at 22 non-impacted residences (see Table VI-4). This optimized noise barrier system benefits a total of 35 equivalent residential units and provides ≥7 dBA noise reduction at 25 residences, equating to 1,264 ft^2/benefitted receptor (BR), which is less than the 2,000 ft^2/BR reasonableness threshold specified by PennDOT guidance, resulting in a noise barrier that is both feasible and reasonable.

TABLE VI-4
NSA 03 AND NSA 04 NOISE BARRIER DATA

NOISE STUDY AREA	RECEPTOR ID	RESIDENTIAL UNITS REPRESENTED	2042 BUILD SOUND LEVEL		INSERTION LOSS FROM OPTIMIZED BARRIER (dBA)
			WITHOUT BARRIER (dBA)	WITH BARRIER (dBA)	
NSA 03	03-01	1	71	61	10
	03-02	1	70	60	10
	03-03	2	69	59	10
	03-04	1	69	59	10
	03-05	4	69	59	10
	03-06	1	69	59	10
	03-07	1	68	59	10
	03-08	1	68	59	9
	03-09	0	43	34	9
	03-10	1	63	57	6
	03-11	2	60	54	6
	03-12	1	63	57	6

TABLE VI-4
(CONTINUED)

NOISE STUDY AREA	RECEPTOR ID	RESIDENTIAL UNITS REPRESENTED	2042 BUILD SOUND LEVEL		INSERTION LOSS FROM OPTIMIZED BARRIER (dBA)
			WITHOUT BARRIER (dBA)	WITH BARRIER (dBA)	
NSA 03 (continued)	03-13	3	64	56	8
	03-14	3	60	54	6
	03-15	3	61	55	7
	03-16	3	60	53	7
	03-17	3	62	58	4
NSA 04	04-01	3	58	54	5
	04-02	1	61	54	7
	04-03	1	61	54	7
	04-04	1	63	56	8
	04-05	1	**67**	60	7

AVERAGE HEIGHT (FT)	LENGTH (FT)	SQUARE FEET	TOTAL BENEFITS	SQUARE FEET/ BENEFITS	FEASIBLE?/ REASONABLE?
18	2,458	44,249	35	1,264	YES / YES

D. NSA 09

A noise barrier was evaluated between the southbound lanes of North George Street and the adjacent noise-impacted land uses of NSA 09 to determine noise abatement feasibility and reasonableness. A 429-foot-long, 14-foot-tall noise barrier was modeled along the top of cut west of the southbound lanes of North George Street, along the eastern side of the driveway for 1926 North George Street.

This 6,000 ft^2 noise barrier provides the required noise reduction of ≥5 dBA for three of the four noise-impacted residential units in NSA 09 (see Table VI-5). This optimized noise barrier benefits a total of three residential units and provides ≥7 dBA noise reduction at three of the noise-impacted residences, equating to 2,000 ft^2/benefitted receptor (BR), which is equal to the 2,000 ft^2/BR reasonableness threshold specified by PennDOT guidance, resulting in a noise barrier that is both feasible and reasonable, based on the acoustic evaluation.

Additional coordination with design engineers determined that there would not be enough area between the top of cut and the driveway for 1926 North George Street to construct and maintain this noise barrier. In order to construct and maintain the barrier at the modeled location,

access to 1926 North George Street would be eliminated, which would require a displacement of the residence. The other option would be to construct a retaining wall for the sole purpose of backfilling behind it to gain enough flat area in which to construct the noise barrier. A cost/benefit analysis determined the estimated $2.5 to $3 million additional expense to construct and maintain a retaining wall/noise barrier design to provide noise abatement for these three residences would be cost prohibitive. As neither of these options are viable, this barrier has been determined to be not feasible as it cannot be designed and physically constructed at the proposed location.

An effective noise barrier was unable to be evaluated for the impacted receptor along Lightner Road (Receptor 9-02) without prohibiting vehicular and pedestrian access to the residential property due to the presence of driveways and side streets.

TABLE VI-5
NSA 09 NOISE BARRIER DATA

NOISE STUDY AREA	RECEPTOR ID	RESIDENTIAL UNITS REPRESENTED	2042 BUILD SOUND LEVEL		INSERTION LOSS FROM OPTIMIZED BARRIER (dBA)
			WITHOUT BARRIER (dBA)	WITH BARRIER (dBA)	
NSA 09	09-01	1	64	64	0
	09-02	1	66	66	0
	09-03	1	62	62	0
	09-04	1	64	64	0
	09-05	1	69	57	12
	09-06	1	68	60	8
	09-07	1	60	59	1
	09-08	1	66	57	8
	09-09	1	60	60	1
	09-10	1	57	57	0
	09-11	1	59	59	0
	09-12	1	59	59	0
	09-13	1	61	61	0
	09-14	1	64	64	0
	09-15	1	60	60	0
	09-16	1	59	59	0

AVERAGE HEIGHT (FT)	LENGTH (FT)	SQUARE FEET	TOTAL BENEFITS	SQUARE FEET/ BENEFITS	FEASIBLE?/ REASONABLE?
14	429	6,000	3	2,000	NO / NO

E. NSA 10

A noise barrier was evaluated between the northbound lanes of North George Street/ Ramp D and the adjacent noise-impacted land uses of NSA 10 to determine noise abatement feasibility and reasonableness. An 864-foot-long, 16.2-foot-tall (average) noise barrier was modeled along the top of cut east of the northbound lanes of North George Street (near approximate Station 29+66 of North George Street), following the top of cut around the southeast side of the roundabout and along Ramp D, and transitioning to the edge of pavement near Station 4+68 of Ramp D and terminating along the edge of pavement near Station 7+60 of Ramp D.

This 13,960 ft^2 noise barrier provides the required noise reduction of ≥5 dBA for three of the five noise-impacted residential units in NSA 10 (see Table VI-6). This optimized noise barrier benefits a total of three residential units and provides ≥7 dBA noise reduction at two of the noise-impacted residences, equating to 4,653 ft^2/benefitted receptor (BR), which is greater than the 2,000 ft^2/BR reasonableness threshold specified by PennDOT guidance, resulting in a noise barrier that is feasible but not reasonable.

TABLE VI-6
NSA 10 NOISE BARRIER DATA

NOISE STUDY AREA	RECEPTOR ID	RESIDENTIAL UNITS REPRESENTED	2042 BUILD SOUND LEVEL		INSERTION LOSS FROM OPTIMIZED BARRIER (dBA)
			WITHOUT BARRIER (dBA)	WITH BARRIER (dBA)	
NSA 10	10-01	1	**68**	60	8
	10-02	1	**67**	62	5
	10-03	1	**68**	61	7
	10-04	1	**71**	**71**	0
	10-05	1	62	61	1
	10-06	1	62	60	2
	10-07	1	**66**	65	1
	10-08	1	62	61	0
	10-09	1	61	61	0
	10-10	1	61	61	0

AVERAGE HEIGHT (FT)	LENGTH (FT)	SQUARE FEET	TOTAL BENEFITS	SQUARE FEET/ BENEFITS	FEASIBLE?/ REASONABLE?
16.2	864	13,960	3	4,653	YES / NO

F. NSA 13

A noise barrier was evaluated between the I-83 southbound lanes and the adjacent noise-impacted land uses of NSA 13 to determine noise abatement feasibility and reasonableness. An 1,816-foot-long, 14-foot-tall noise barrier was modeled along the edge of shoulder from Station 329+00 of I-83 to Station 311+00 of I-83.

This 25,420 ft^2 noise barrier provides the required noise reduction of ≥5 dBA for the two noise-impacted residential units and provides ≥5 dBA noise reduction at four non-impacted residences (see Table VI-7). This optimized noise barrier benefits a total of six residential units and provides ≥7 dBA noise reduction at all of the benefitted residences, equating to 4,237 ft^2/ benefitted receptor (BR), which is greater than the 2,000 ft^2/BR reasonableness threshold specified by PennDOT guidance, resulting in a noise barrier that is feasible but not reasonable.

TABLE VI-7
NSA 13 NOISE BARRIER DATA

NOISE STUDY AREA	RECEPTOR ID	RESIDENTIAL UNITS REPRESENTED	2042 BUILD SOUND LEVEL		INSERTION LOSS FROM OPTIMIZED BARRIER (dBA)
			WITHOUT BARRIER (dBA)	WITH BARRIER (dBA)	
NSA 13	13-01	2	67	60	7
	13-02	2	61	53	8
	13-03	2	61	53	8

AVERAGE HEIGHT (FT)	LENGTH (FT)	SQUARE FEET	TOTAL BENEFITS	SQUARE FEET/ BENEFITS	FEASIBLE?/ REASONABLE?
14	1,816	25,420	6	4,237	YES / NO

G. NSA 14

A noise barrier was evaluated between East Philadelphia Street/North Belmont Street and the adjacent noise-impacted land uses of NSA 14 to determine noise abatement feasibility and reasonableness. A 720-foot-long, 20-foot-tall noise barrier was modeled along the edge of shoulder of eastbound East Philadelphia Street, continuing along the edge of shoulder of southbound North Belmont Street.

This 14,400 ft^2 noise barrier provides the required noise reduction of ≥5 dBA for all three noise-impacted residences (see Table VI-8). This optimized noise barrier benefits a total of three residential units and provides ≥7 dBA noise reduction at all three of the noise-impacted residences, equating to 4,800 ft^2/benefitted receptor (BR), which is greater than the 2,000 ft^2/BR reasonableness threshold specified by PennDOT guidance, resulting in a noise barrier that is feasible but not reasonable.

TABLE VI-8
NSA 14 NOISE BARRIER DATA

NOISE STUDY AREA	RECEPTOR ID	RESIDENTIAL UNITS REPRESENTED	2042 BUILD SOUND LEVEL		INSERTION LOSS FROM OPTIMIZED BARRIER (dBA)
			WITHOUT BARRIER (dBA)	WITH BARRIER (dBA)	
NSA 14	14-01	1	62	62	0
	14-02	1	63	63	0
	14-03	1	63	63	0
	14-04	1	64	64	0
	14-05	1	65	65	0
	14-06	2	63	63	0
	14-07	1	65	65	0
	14-08	1	**66**	60	6
	14-09	2	61	61	0
	14-10	2	63	63	0
	14-11	1	65	64	0
	14-12	1	65	64	1
	14-13	1	**66**	60	5
	14-14	2	60	59	0
	14-15	2	61	61	0
	14-16	1	64	64	1
	14-17	1	64	61	4
	14-18	1	**66**	59	7

AVERAGE HEIGHT (FT)	LENGTH (FT)	SQUARE FEET	TOTAL BENEFITS	SQUARE FEET/ BENEFITS	FEASIBLE?/ REASONABLE?
20	720	14,400	3	4,800	YES / NO

H. NSA 15

Although noise abatement consideration is warranted for NSA 15, a noise barrier was unable to be evaluated for noise-impacted parcels along East Market Street within NSA 15 without prohibiting pedestrian access to multiple commercial properties located along East Market Street. Due to this constraint on pedestrian access, noise abatement for NSA 15 was determined to be not feasible.

I. NSA 16

Noise mitigation for NSA 16 incorporates a two-barrier system that effectively provides noise abatement to the entire community. Two noise barriers were evaluated between the southbound lanes of I-83 and the adjacent noise-impacted land uses of NSA 16 to determine noise abatement feasibility and reasonableness. A 744-foot-long, 16-foot-tall noise barrier was modeled along the edge of shoulder of southbound I-83 from Station 12+50 of Ramp M to Station 233+00 of I-83. A second (1,487-foot-long, 16-foot-tall) noise barrier was modeled along the edge of shoulder of southbound I-83 from Station 4+24 of Ramp T to Station 219+00 of I-83.

These two noise barriers, totaling 35,688 ft^2, provide the required noise reduction of ≥5 dBA for all 13 of the noise-impacted equivalent residential units and provide ≥5 dBA noise reduction at 11 non-impacted residences (see Table VI-9). This optimized noise barrier system benefits a total of 24 equivalent residential units and provides ≥7 dBA noise reduction at 12 residences, equating to 1,487 ft^2/benefitted receptor (BR), which is less than the 2,000 ft^2/BR reasonableness threshold specified by PennDOT guidance, resulting in a noise barrier that is both feasible and reasonable.

TABLE VI-9
NSA 16 NOISE BARRIER DATA

NOISE STUDY AREA	RECEPTOR ID	RESIDENTIAL UNITS REPRESENTED	2042 BUILD SOUND LEVEL		INSERTION LOSS FROM OPTIMIZED BARRIER (dBA)
			WITHOUT BARRIER (dBA)	WITH BARRIER (dBA)	
NSA 16	16-01	1	61	59	2
	16-02	1	62	59	2
	16-03	1	63	60	3
	16-04	1	64	62	2
	16-05	1	68	62	6
	16-06	1	63	61	3
	16-07	1	58	55	3

TABLE VI-9
(CONTINUED)

NOISE STUDY AREA	RECEPTOR ID	RESIDENTIAL UNITS REPRESENTED	2042 BUILD SOUND LEVEL		INSERTION LOSS FROM OPTIMIZED BARRIER (dBA)
			WITHOUT BARRIER (dBA)	WITH BARRIER (dBA)	
NSA 16 (continued)	16-08	1	59	54	4
	16-09	1	61	58	3
	16-10	1	63	60	4
	16-11	1	66	59	7
	16-12	1	67	60	8
	16-13	1	59	55	4
	16-14	1	62	61	1
	16-15	1	62	57	5
	16-16	1	63	56	6
	16-17	1	65	57	7
	16-18	1	68	59	9
	16-19	1	63	61	2
	16-20	1	64	59	5
	16-21	1	64	57	7
	16-22	1	66	59	7
	16-23	1	66	59	8
	16-24	1	69	61	9
	16-25	2	64	59	5
	16-26	1	65	59	6
	16-27	1	67	60	7
	16-28	2	64	59	5
	16-29	1	64	59	6
	16-30	1	66	60	6
	16-31	1	70	61	9
	16-32	1	70	62	8
	16-33	1	68	61	6
	16-34	1	69	62	8

AVERAGE HEIGHT (FT)	LENGTH (FT)	SQUARE FEET	TOTAL BENEFITS	SQUARE FEET/ BENEFITS	FEASIBLE?/ REASONABLE?
16	2,231	35,688	24	1,487	YES / YES

VII. CONSTRUCTION NOISE

VII. CONSTRUCTION NOISE

Throughout the construction phase of the I-83 North York Widening Project, noise-sensitive land uses that are analyzed for traffic noise impacts are also susceptible to construction noise impacts. Typical highway construction/reconstruction equipment (such as loaders, dump trucks, graders, bulldozers, etc.) are likely to temporarily elevate noise within the project area. Sensitive receptors within 100 to 200 feet of construction activities may experience varying periods and degrees of noise impact, with potential noise levels between 75 and 85 dBA, depending on the nature of the construction activity, the type of equipment in use, and the relative proximity to the activity.

Construction noise can be minimized by implementing specific measures to help mitigate the noise at the source. The contractor shall exercise proper maintenance procedures for all construction equipment regularly and thoroughly. Replacement of failing or ineffective muffling and exhaust systems, periodic lubrication of moving parts, and properly tuned engines are necessary in order to keep construction equipment noise emissions to a minimum.

Low-cost, easy-to-implement measures should be incorporated into project plans and specifications (e.g., work-hour limits, elimination of “tailgate banging,” reduction of backing up for equipment with alarms, complaint mechanisms). Additionally, several other specific mitigation procedures can be incorporated to help to minimize construction noise impacts. Temporary noise barriers, varying the areas of construction activity, community input regarding the sequence of operations, and financial incentives for the contractor to keep construction noise levels at a minimum are all things to be considered in order to reduce the severity of construction noise impacts during the construction phase.

Prior to any construction activity, the Engineering District should coordinate with the communities and local municipalities to determine any potential issues regarding construction noise and establish periods of time when construction activities that cause high noise levels should not occur. If construction noise specifications are required to be included in PS&E packages, detailed coordination is suggested between PennDOT and the local municipality.

VIII. LOCAL OFFICIALS/PUBLIC INVOLVEMENT

VIII. LOCAL OFFICIALS/PUBLIC INVOLVEMENT

FHWA and PennDOT policies require that PennDOT provide certain information to local officials within whose jurisdiction the highway project is located in order to minimize future traffic noise impacts of Type I projects on currently undeveloped lands. (Type I projects involve highway improvements with noise analysis.) This must include information on noise-compatible land use planning, noise impact zones in undeveloped land in the highway project corridor, and federal participation in Type II projects (noise abatement only). This section of the report provides that information as well as information about PennDOT's noise abatement program. PennDOT's current noise policy outlines PennDOT's approach to communication with local officials and provides information and resources on highway noise and noise-compatible land use planning. PennDOT's intention is to assist local officials in planning the uses of undeveloped land adjacent to highways to minimize potential impacts of highway traffic noise.

"Entering the Quiet Zone" is a brochure that provides general information and examples to elected officials, planners, developers, and the general public about the problem of traffic noise and effective responses to it. The following is a link to this brochure on FHWA's website: https://www.fhwa.dot.gov/environMent/noise/noise_compatible_planning/federal_approach/land_use/qz10.cfm.

A wide variety of administrative strategies may be used to minimize or eliminate potential highway noise impacts, thereby preventing the need or desire for costly noise abatement structures (such as noise barriers) in future years. There are five broad categories of such strategies:

- zoning,
- other legal restrictions (subdivision control, building codes, health codes),
- municipal ownership or control of the land,
- financial incentives for compatible development, and
- educational and advisory services.

"The Audible Landscape: A Manual for Highway and Land Use" is a well-written and comprehensive guide addressing these noise-compatible land use planning strategies, with significant detailed information. This document is available through FHWA's website, at https://www.fhwa.dot.gov/environment/noise/noise_compatible_planning/federal_approach/audible_landscape/.

Noise level contours are lines of equal noise exposure that typically parallel roadway alignments and are often useful to local officials in corridors with undeveloped land. Highway traffic noise is considered a linear noise source, and sound levels can drop considerably over distance. The degree that sound levels decrease can vary based on a number of different factors, including objects that shield the roadway noise, terrain features, building rows, and ground cover type (e.g., pavement, grass, or snow). The use of noise level contours has become increasingly popular over the last several years as they have been implemented in planning programs for undeveloped areas with roadway noise influence. Through conscious planning efforts and noise contour generation, municipal officials can restrict future development inside the noise impact zone (i.e., the area within the 66-dBA noise contour).

The majority of the I-83 North York corridor is fully developed. All undeveloped lands within the project corridor adjacent to I-83, with one exception, have been identified as zoned for industrial use and would be considered Activity Category F land uses. Activity Category F land uses are not noise-sensitive and do not require noise analysis. The one undeveloped land that has been identified with the potential for residential development is located adjacent to the southbound lanes of I-83, south of U.S. Route 30 and immediately southwest of and adjacent to East 10th Avenue/Columbia Avenue. For this undeveloped property, the 66-dBA contour is located approximately 140 feet from the edge of pavement of Ramp Z/I-83 southbound.

In regard to public involvement, public meetings and/or workshops are an appropriate forum to discuss and present the findings of the environmental studies to the public. During the Final Design phase of the project, specific public meetings will be organized with communities where noise abatement is considered warranted, feasible, and reasonable in accordance with PennDOT's three-phased approach. The information and conclusions contained in the Final Design Noise Analysis report will be discussed with the neighborhoods (after FHWA approval of the report), and the results of the meetings will be documented in the final version of the Final Design Noise Analysis document.

IX. LIST OF PREPARERS AND REVIEWERS

IX. LIST OF PREPARERS AND REVIEWERS

Alan Dunay
Acoustical and Air Quality Specialist
BS/1997/Biology
22 Years' Experience
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4 Years' Experience
Noise Monitoring, Noise Modeling, Report Preparation

X. APPENDICES

APPENDIX A -
SITE SKETCHES

I-83 North York Widening
Short-term Ambient Monitoring

Site # TMS 2-1 **Description:** 267 Point Cir

MONITORING INFORMATION

Notes:

Date:	12/11/2018
Start Time:	10:34:00
End Time:	10:54:00
Meter ID:	db-3080 SN 3895
Response Rate:	slow
	I-83
Roadway:	NB / SB
Cars:	377/410
MT:	39/36
HT:	91/111
	US 30
Roadway:	EB / WB
Cars:	401/388
MT:	35/45
HT:	52/33
	I-83 to US 30 WB/
	US 30 WB to I-83
Roadway:	To 30 /From 30
Cars:	170/76
MT:	9/14
HT:	11/18

Time	Lav (dBA)	Time	Lav (dBA)
10:34:00	62.3	10:44:00	63.5
10:34:30	64.1	10:44:30	62.8
10:35:00	61.7	10:45:00	63.4
10:35:30	61.0	10:45:30	63.0
10:36:00	63.3	10:46:00	64.1
10:36:30	64.7	10:46:30	63.7
10:37:00	61.1	10:47:00	62.5
10:37:30	64.0	10:47:30	64.2
10:38:00	64.6	10:48:00	63.8
10:38:30	63.2	10:48:30	61.2
10:39:00	63.1	10:49:00	63.9
10:39:30	63.5	10:49:30	64.7
10:40:00	65.3	10:50:00	62.2
10:40:30	63.8	10:50:30	60.8
10:41:00	65.2	10:51:00	65.7
10:41:30	65.4	10:51:30	64.2
10:42:00	62.4	10:52:00	66.6
10:42:30	63.6	10:52:30	64.6
10:43:00	63.4	10:53:00	62.3
10:43:30	63.0	10:53:30	61.9

Leq (dBA)
63.7

SITE SKETCH:

North Arrow

Site Specifics

Pavement Type:	Grade:	Site Surface:	Employee:
asphalt	Above	soft	ERZ, LMG

Atmospheric Conditions :
fair, light wind (2-3 mph wind), 34o F

I-83 North York Widening
Short-term Ambient Monitoring

Site # TMS 2-2 **Description:** 222 Arsenal Rd

MONITORING INFORMATION

Notes:

Date:	12/11/2018
Start Time:	10:34:00
End Time:	10:54:00
Meter ID:	db-3080 SN 5093
Response Rate:	slow
	I-83
Roadway:	NB / SB
Cars:	377/410
MT:	39/36
HT:	91/111
	US 30
Roadway:	EB / WB
Cars:	401/388
MT:	35/45
HT:	52/33
	I-83 to US 30 WB/
	US 30 WB to I-83
Roadway:	To 30 /From 30
Cars:	170/76
MT:	9/14
HT:	11/18

Time	Lav (dBA)	Time	Lav (dBA)
10:34:00	61.5	10:44:00	63.4
10:34:30	62.5	10:44:30	63.5
10:35:00	65.7	10:45:00	65.2
10:35:30	63.6	10:45:30	60.8
10:36:00	62.7	10:46:00	67.2
10:36:30	67.0	10:46:30	68.7
10:37:00	62.8	10:47:00	63.6
10:37:30	65.0	10:47:30	64.1
10:38:00	66.1	10:48:00	65.9
10:38:30	64.2	10:48:30	62.6
10:39:00	64.4	10:49:00	68.0
10:39:30	65.0	10:49:30	63.1
10:40:00	67.4	10:50:00	64.2
10:40:30	69.0	10:50:30	63.3
10:41:00	64.6	10:51:00	68.8
10:41:30	68.6	10:51:30	64.8
10:42:00	62.3	10:52:00	72.5
10:42:30	68.6	10:52:30	63.9
10:43:00	67.6	10:53:00	65.8
10:43:30	63.3	10:53:30	65.4

Leq (dBA)
66.0

SITE SKETCH:

North Arrow

Site Specifics

Pavement Type:	Grade:	Site Surface:	Employee:
asphalt	Above	soft	ERZ, LMG

Atmospheric Conditions :
fair, light wind (2-3 mph wind), 34o F

I-83 North York Widening
Short-term Ambient Monitoring

Site # TMS 2-3 **Description:** 222 Arsenal Rd

MONITORING INFORMATION

Notes: Econo Lodge

Date:	12/11/2018
Start Time:	10:34:00
End Time:	10:54:00
Meter ID:	db-3080 SN 3897
Response Rate:	slow
	I-83
Roadway:	NB / SB
Cars:	377/410
MT:	39/36
HT:	91/111
	US 30
Roadway:	EB / WB
Cars:	401/388
MT:	35/45
HT:	52/33
	I-83 to US 30 WB/
	US 30 WB to I-83
Roadway:	To 30 /From 30
Cars:	170/76
MT:	9/14
HT:	11/18

Time	Lav (dBA)	Time	Lav (dBA)
10:34:00	63.3	10:44:00	66.5
10:34:30	66.8	10:44:30	67.5
10:35:00	67.2	10:45:00	65.9
10:35:30	64.1	10:45:30	64.7
10:36:00	65.9	10:46:00	71.0
10:36:30	67.8	10:46:30	67.9
10:37:00	64.7	10:47:00	67.0
10:37:30	69.6	10:47:30	67.7
10:38:00	67.1	10:48:00	66.8
10:38:30	64.8	10:48:30	64.9
10:39:00	68.2	10:49:00	70.8
10:39:30	66.5	10:49:30	67.9
10:40:00	69.2	10:50:00	64.6
10:40:30	69.4	10:50:30	66.7
10:41:00	68.5	10:51:00	68.0
10:41:30	69.3	10:51:30	69.8
10:42:00	67.1	10:52:00	71.0
10:42:30	66.4	10:52:30	71.0
10:43:00	67.3	10:53:00	66.9
10:43:30	65.3	10:53:30	68.0

Leq (dBA)
67.7

SITE SKETCH:

North Arrow ↑

Site Specifics

Pavement Type:	Grade:	Site Surface:	Employee:
asphalt	Above	soft	ERZ, LMG

Atmospheric Conditions :
fair, light wind (2-3 mph wind), 34o F

I-83 North York Widening
Short-term Ambient Monitoring

Site # TMS 3-2 Description: 1550 Eleventh Avenue

MONITORING INFORMATION

Notes:

Date:	12/11/2018
Start Time:	11:22:00
End Time:	11:42:00
Meter ID:	db-3080 SN 5093
Response Rate:	slow
	I-83
Roadway:	NB / SB
Cars:	476 / 460
MT:	40 / 36
HT:	76 / 54

Time	Lav (dBA)	Time	Lav (dBA)
11:22:00	67.2	11:32:00	67.6
11:22:30	66.0	11:32:30	67.0
11:23:00	65.8	11:33:00	65.9
11:23:30	67.3	11:33:30	67.1
11:24:00	67.1	11:34:00	68.4
11:24:30	68.8	11:34:30	67.2
11:25:00	68.9	11:35:00	66.2
11:25:30	68.7	11:35:30	68.9
11:26:00	67.0	11:36:00	68.9
11:26:30	65.8	11:36:30	67.4
11:27:00	67.6	11:37:00	66.7
11:27:30	67.6	11:37:30	69.3
11:28:00	67.9	11:38:00	70.0
11:28:30	67.8	11:38:30	67.4
11:29:00	65.8	11:39:00	67.2
11:29:30	67.7	11:39:30	69.0
11:30:00	70.0	11:40:00	68.6
11:30:30	67.3	11:40:30	67.7
11:31:00	67.9	11:41:00	67.9
11:31:30	68.4	11:41:30	68.9

Leq (dBA)
67.8

SITE SKETCH:

North Arrow ↑

Site Specifics

Pavement Type:	Grade:	Site Surface:	Employee:
asphalt	Above	soft	ERZ, LMG

Atmospheric Conditions :
fair, light wind (2-3 mph wind), 35o F

I-83 North York Widening
Short-term Ambient Monitoring

Site # 4-1 **Description: 69 N Yale St**

MONITORING INFORMATION

Notes:

Date:	12/11/2018
Start Time:	13:05:00
End Time:	13:25:00
Meter ID:	db-3080 SN 3895
Response Rate:	slow
	I-83
Roadway:	NB / SB
Cars:	489 / 576
MT:	58 / 55
HT:	74 / 77

Time	Lav (dBA)	Time	Lav (dBA)
13:05:00	64.9	13:15:00	62.4
13:05:30	65.0	13:15:30	65.0
13:06:00	60.7	13:16:00	77.3
13:06:30	62.0	13:16:30	61.2
13:07:00	61.8	13:17:00	64.0
13:07:30	60.2	13:17:30	60.9
13:08:00	60.7	13:18:00	61.0
13:08:30	64.3	13:18:30	59.7
13:09:00	62.2	13:19:00	63.3
13:09:30	63.1	13:19:30	61.6
13:10:00	62.4	13:20:00	63.6
13:10:30	60.2	13:20:30	59.2
13:11:00	63.1	13:21:00	65.8
13:11:30	62.7	13:21:30	64.5
13:12:00	65.5	13:22:00	61.7
13:12:30	56.7	13:22:30	62.2
13:13:00	57.9	13:23:00	61.2
13:13:30	66.9	13:23:30	58.7
13:14:00	65.4	13:24:00	59.8
13:14:30	62.8	13:24:30	67.7

Leq (dBA)
65.4

SITE SKETCH:

North Arrow ↑

Site Specifics

Pavement Type:	Grade:	Site Surface:	Employee:
asphalt	Above	soft	ERZ, LMG

Atmospheric Conditions :
fair, light wind (2-3 mph wind), 37o F

I-83 North York Widening
Short-term Ambient Monitoring

Site # TMS 4-2 Description: 28 North Belmont St

MONITORING INFORMATION

Notes:

Date:	12/11/2018
Start Time:	13:05:00
End Time:	13:25:00
Meter ID:	db-3080 SN 5093
Response Rate:	slow
	I-83
Roadway:	NB / SB
Cars:	489 / 576
MT:	58 / 55
HT:	74 / 77

Time	Lav (dBA)	Time	Lav (dBA)
13:05:00	58.5	13:15:00	60.0
13:05:30	61.0	13:15:30	64.6
13:06:00	66.4	13:16:00	58.7
13:06:30	59.8	13:16:30	61.3
13:07:00	60.6	13:17:00	66.6
13:07:30	63.6	13:17:30	65.0
13:08:00	62.2	13:18:00	59.6
13:08:30	61.1	13:18:30	57.1
13:09:00	66.4	13:19:00	61.1
13:09:30	61.6	13:19:30	61.8
13:10:00	63.4	13:20:00	59.9
13:10:30	61.9	13:20:30	62.8
13:11:00	60.4	13:21:00	59.1
13:11:30	62.5	13:21:30	60.1
13:12:00	61.7	13:22:00	60.6
13:12:30	58.5	13:22:30	60.5
13:13:00	58.7	13:23:00	59.6
13:13:30	62.4	13:23:30	60.1
13:14:00	62.8	13:24:00	60.6
13:14:30	65.0	13:24:30	61.7

Leq (dBA)
62.2

SITE SKETCH:

North Arrow

Site Specifics

Pavement Type:	Grade:	Site Surface:	Employee:
asphalt	Above	soft	ERZ, LMG

Atmospheric Conditions :
fair, light wind (2-3 mph wind), 37o F

I-83 North York Widening
Short-term Ambient Monitoring

Site # TM S4-3 Description: 54 North Oxford St

MONITORING INFORMATION

Notes:

Date:	3/27/2019
Start Time:	15:04:00
End Time:	15:24:00
Meter ID:	db-3080 SN 3895
Response Rate:	slow
Roadway:	I-83 NB / SB
Cars:	496 / 542
MT:	58 /49
HT:	74 / 68
	North Hills Rd NB / SB
	264/238
	20/ 12
	16 / 4
	North Hills Rd to I-83 NB
	~~164~~
	~~6~~
	~~2~~

Time	Lav (dBA)	Time	Lav (dBA)
15:04:00	68.3	15:14:00	68.2
15:04:30	71.1	15:14:30	63.5
15:05:00	65.9	15:15:00	64.0
15:05:30	64.3	15:15:30	67.7
15:06:00	67.2	15:16:00	67.4
15:06:30	63.9	15:16:30	68.1
15:07:00	64.9	15:17:00	64.9
15:07:30	62.5	15:17:30	66.1
15:08:00	65.4	15:18:00	67.7
15:08:30	68.2	15:18:30	66.2
15:09:00	67.8	15:19:00	63.1
15:09:30	66.7	15:19:30	62.2
15:10:00	63.8	15:20:00	68.5
15:10:30	66.5	15:20:30	66.8
15:11:00	65.3	15:21:00	62.9
15:11:30	63.8	15:21:30	64.9
15:12:00	67.0	15:22:00	63.8
15:12:30	63.6	15:22:30	67.2
15:13:00	66.2	15:23:00	66.8
15:13:30	65.8	15:23:30	66.2

Leq (dBA)
66.5

SITE SKETCH:

North Arrow

Site Specifics

Pavement Type:	Grade:	Site Surface:	Employee:
asphalt	N Hills Rd: at grade, I-83: below grade	soft	ERZ, LMG

Atmospheric Conditions :
fair, light wind (3 mph wind), 48° F

I-83 North York Widening
Short-term Ambient Monitoring

Site # TMS 4-6 Description: 1775 E Market St

MONITORING INFORMATION

Notes:

Date:	12/11/2018
Start Time:	13:05:00
End Time:	13:25:00
Meter ID:	db-3080 SN 4618
Response Rate:	slow
	I-83
Roadway:	NB / SB
Cars:	489 / 576
MT:	58 / 55
HT:	74 / 77

Time	Lav (dBA)	Time	Lav (dBA)
13:05:00	62.7	13:15:00	65.4
13:05:30	64.1	13:15:30	62.0
13:06:00	61.6	13:16:00	64.0
13:06:30	61.7	13:16:30	64.1
13:07:00	63.7	13:17:00	64.8
13:07:30	61.9	13:17:30	64.2
13:08:00	62.0	13:18:00	60.5
13:08:30	62.4	13:18:30	63.6
13:09:00	63.4	13:19:00	62.8
13:09:30	65.2	13:19:30	63.6
13:10:00	64.3	13:20:00	64.1
13:10:30	62.9	13:20:30	63.4
13:11:00	64.3	13:21:00	63.1
13:11:30	65.0	13:21:30	62.2
13:12:00	62.6	13:22:00	64.3
13:12:30	62.4	13:22:30	62.4
13:13:00	63.3	13:23:00	63.6
13:13:30	66.6	13:23:30	64.5
13:14:00	67.5	13:24:00	65.9
13:14:30	65.9	13:24:30	63.5

Leq (dBA)
63.7

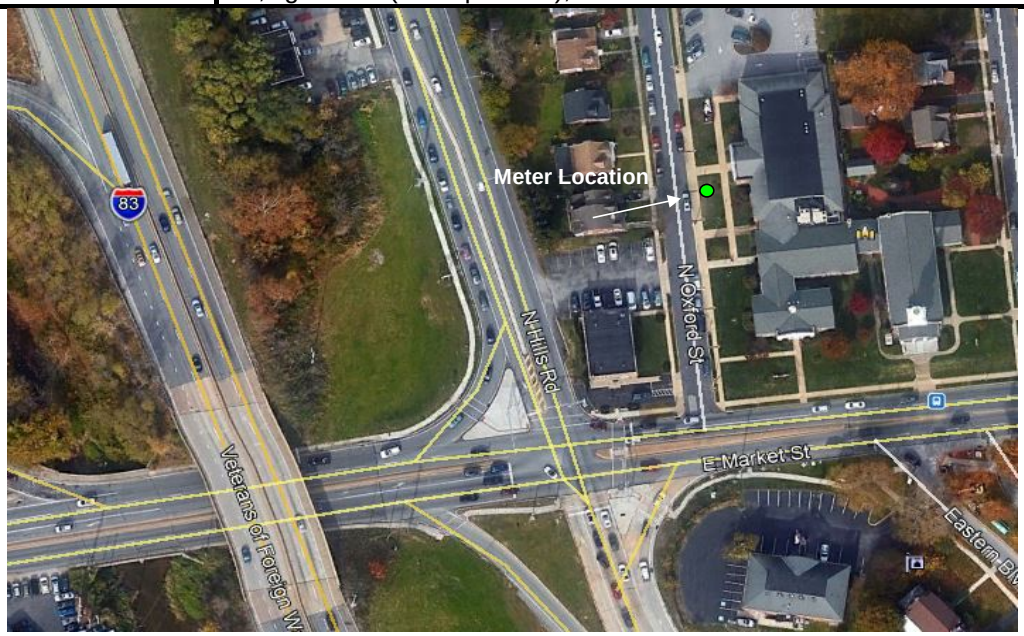
SITE SKETCH:

North Arrow

Site Specifics

Pavement Type:	Grade:	Site Surface:	Employee:
asphalt	Above	soft	ERZ, LMG

Atmospheric Conditions :
fair, light wind (2-3 mph wind), 37o F



I-83 North York Widening
Short-term Ambient Monitoring

Site # TMS 5-1 Description: 1871 3rd Ave

MONITORING INFORMATION

Notes:

Date:	12/11/2018
Start Time:	14:09:00
End Time:	14:29:00
Meter ID:	db-3080 SN 3895
Response Rate:	slow
Roadway:	I-83 NB / SB
Cars:	434 / 624
MT:	44 / 35
HT:	61 / 67
Roadway:	Exit 19 Offramp
Cars:	261
MT:	15
HT:	12

Time	Lav (dBA)	Time	Lav (dBA)
14:09:00	67.6	14:19:00	67.0
14:09:30	65.6	14:19:30	72.1
14:10:00	64.8	14:20:00	70.6
14:10:30	65.8	14:20:30	69.0
14:11:00	67.7	14:21:00	64.9
14:11:30	66.6	14:21:30	67.7
14:12:00	67.3	14:22:00	67.9
14:12:30	68.8	14:22:30	65.6
14:13:00	67.5	14:23:00	65.6
14:13:30	66.9	14:23:30	67.9
14:14:00	65.9	14:24:00	69.5
14:14:30	67.8	14:24:30	68.5
14:15:00	65.5	14:25:00	64.5
14:15:30	66.6	14:25:30	69.8
14:16:00	66.1	14:26:00	64.0
14:16:30	66.8	14:26:30	67.0
14:17:00	65.9	14:27:00	64.3
14:17:30	67.4	14:27:30	65.2
14:18:00	65.8	14:28:00	67.2
14:18:30	65.2	14:28:30	65.7

Leq (dBA)
67.3

SITE SKETCH:

North Arrow

Site Specifics

Pavement Type:	Grade:	Site Surface:	Employee:
asphalt	Above	soft	ERZ, LMG

Atmospheric Conditions :
fair, light wind (2-3 mph wind), 39o F

I-83 North York Widening
Short-term Ambient Monitoring

Site # TMS 5-2 Description: 150 S Manheim St

MONITORING INFORMATION

Notes:

Date:	12/11/2018
Start Time:	14:09:00
End Time:	14:29:00
Meter ID:	db-3080 SN 5093
Response Rate:	slow
	I-83
Roadway:	NB / SB
Cars:	434 / 624
MT:	44 / 35
HT:	61 / 67
Roadway:	Exit 19 Offramp
Cars:	261
MT:	15
HT:	12

Time	Lav (dBA)	Time	Lav (dBA)
14:09:00	69.8	14:19:00	69.7
14:09:30	68.7	14:19:30	68.6
14:10:00	67.2	14:20:00	69.6
14:10:30	68.0	14:20:30	71.9
14:11:00	69.2	14:21:00	70.7
14:11:30	69.4	14:21:30	68.7
14:12:00	69.3	14:22:00	70.2
14:12:30	70.3	14:22:30	69.5
14:13:00	70.4	14:23:00	68.9
14:13:30	70.5	14:23:30	69.3
14:14:00	68.6	14:24:00	71.2
14:14:30	71.1	14:24:30	69.7
14:15:00	69.8	14:25:00	70.2
14:15:30	71.2	14:25:30	70.4
14:16:00	68.9	14:26:00	72.0
14:16:30	68.8	14:26:30	64.8
14:17:00	68.0	14:27:00	70.4
14:17:30	69.8	14:27:30	68.4
14:18:00	70.7	14:28:00	67.9
14:18:30	68.1	14:28:30	69.6

Leq (dBA)
69.7

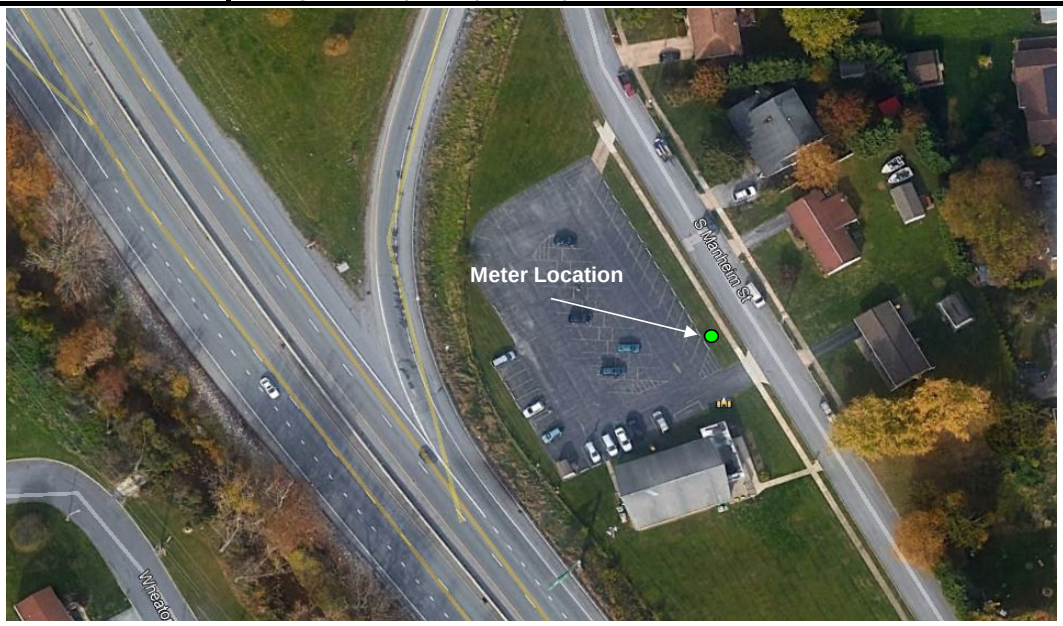
SITE SKETCH:

North Arrow

Site Specifics

Pavement Type:	Grade:	Site Surface:	Employee:
asphalt	Above	soft	ERZ, LMG

Atmospheric Conditions :
fair, light wind (2-3 mph wind), 39o F



I-83 North York Widening
Short-term Ambient Monitoring

Site # TMS 5-3 Description: 1834 Eastern Blvd

MONITORING INFORMATION

Notes:

Date: 12/11/2018
Start Time: 14:09:00
End Time: 14:29:00
Meter ID: db-3080 SN 3897
Response Rate: slow

I-83
Roadway: NB / SB
Cars: 434 / 624
MT: 44 / 35
HT: 61 / 67

Roadway: Exit 19 Offramp
Cars: 261
MT: 15
HT: 12

Time	Lav (dBA)	Time	Lav (dBA)
14:09:00	64.2	14:19:00	64.6
14:09:30	64.9	14:19:30	62.3
14:10:00	65.8	14:20:00	64.9
14:10:30	65.0	14:20:30	66.4
14:11:00	64.4	14:21:00	63.2
14:11:30	63.8	14:21:30	64.7
14:12:00	64.6	14:22:00	65.0
14:12:30	67.0	14:22:30	62.6
14:13:00	64.2	14:23:00	63.3
14:13:30	64.9	14:23:30	63.7
14:14:00	63.4	14:24:00	66.2
14:14:30	65.4	14:24:30	65.0
14:15:00	64.7	14:25:00	63.9
14:15:30	64.2	14:25:30	63.8
14:16:00	63.5	14:26:00	62.6
14:16:30	63.7	14:26:30	61.3
14:17:00	62.2	14:27:00	63.3
14:17:30	63.6	14:27:30	61.7
14:18:00	62.6	14:28:00	63.3
14:18:30	63.5	14:28:30	63.4

Leq (dBA)
64.3

SITE SKETCH:

North Arrow

Site Specifics

Pavement Type:	Grade:	Site Surface:	Employee:
asphalt	Above	soft	ERZ, LMG

Atmospheric Conditions :
fair, light wind (2-3 mph wind), 39o F

I-83 North York Widening
Short-term Ambient Monitoring

Site # TMS 5-6 Description: 1770 E Market St

MONITORING INFORMATION

Notes:

Date:	12/11/2018
Start Time:	14:09:00
End Time:	14:29:00
Meter ID:	db-3080 SN 4618
Response Rate:	slow
	I-83
Roadway:	NB / SB
Cars:	434 / 624
MT:	44 / 35
HT:	61 / 67
Roadway:	Exit 19 Offramp
Cars:	261
MT:	15
HT:	12

Time	Lav (dBA)	Time	Lav (dBA)
14:09:00	65.6	14:19:00	66.1
14:09:30	64.9	14:19:30	66.3
14:10:00	65.1	14:20:00	69.4
14:10:30	65.6	14:20:30	67.9
14:11:00	65.2	14:21:00	63.5
14:11:30	66.7	14:21:30	67.6
14:12:00	67.2	14:22:00	66.7
14:12:30	68.4	14:22:30	65.8
14:13:00	66.0	14:23:00	64.9
14:13:30	65.1	14:23:30	69.1
14:14:00	66.7	14:24:00	68.3
14:14:30	68.0	14:24:30	66.8
14:15:00	66.4	14:25:00	65.3
14:15:30	65.7	14:25:30	66.1
14:16:00	65.2	14:26:00	64.9
14:16:30	66.0	14:26:30	67.7
14:17:00	66.5	14:27:00	63.9
14:17:30	66.8	14:27:30	64.4
14:18:00	66.4	14:28:00	65.7
14:18:30	66.4	14:28:30	65.2

Leq (dBA)
66.5

SITE SKETCH:

North Arrow

Site Specifics

Pavement Type:	Grade:	Site Surface:	Employee:
asphalt	Above	soft	ERZ, LMG

Atmospheric Conditions :
fair, light wind (2-3 mph wind), 39o F

I-83 North York Widening
Short-term Ambient Monitoring

Site # TMS 6-1 **Description:** 400 Elmwood Blvd

MONITORING INFORMATION

Notes:

Date:	12/11/2018
Start Time:	14:47:00
End Time:	15:07:00
Meter ID:	db-3080 SN 3895
Response Rate:	slow
Roadway:	I-83 NB / SB
Cars:	428 / 589
MT:	44 / 38
HT:	57 / 67

Time	Lav (dBA)	Time	Lav (dBA)
14:47:00	66.2	14:57:00	61.5
14:47:30	66.4	14:57:30	65.1
14:48:00	69.0	14:58:00	62.0
14:48:30	63.9	14:58:30	66.8
14:49:00	68.0	14:59:00	65.0
14:49:30	65.4	14:59:30	63.4
14:50:00	69.3	15:00:00	63.1
14:50:30	65.5	15:00:30	64.3
14:51:00	63.9	15:01:00	64.1
14:51:30	65.3	15:01:30	66.0
14:52:00	62.3	15:02:00	70.4
14:52:30	60.4	15:02:30	63.9
14:53:00	63.5	15:03:00	65.6
14:53:30	66.3	15:03:30	65.0
14:54:00	66.5	15:04:00	65.5
14:54:30	65.4	15:04:30	66.2
14:55:00	64.8	15:05:00	68.9
14:55:30	63.7	15:05:30	64.4
14:56:00	64.6	15:06:00	64.6
14:56:30	66.8	15:06:30	64.2

Leq (dBA)
65.6

SITE SKETCH:

North Arrow

Site Specifics

Pavement Type:	Grade:	Site Surface:	Employee:
asphalt	above highway	soft	ERZ, LMG

Atmospheric Conditions :
fair, light wind (2-3 mph wind), 40° F

I-83 North York Widening
Short-term Ambient Monitoring

Site # TMS 6-2 Description: 1759 3rd Ave

MONITORING INFORMATION

Notes:

Date:	12/11/2018
Start Time:	14:47:00
End Time:	15:07:00
Meter ID:	db-3080 SN 5093
Response Rate:	slow
	I-83
Roadway:	NB / SB
Cars:	428 / 589
MT:	44 / 38
HT:	57 / 67

Time	Lav (dBA)	Time	Lav (dBA)
14:47:00	65.1	14:57:00	62.2
14:47:30	68	14:57:30	65.7
14:48:00	70.5	14:58:00	63.8
14:48:30	64	14:58:30	65.4
14:49:00	68.7	14:59:00	67.4
14:49:30	67.1	14:59:30	64.9
14:50:00	65	15:00:00	63.2
14:50:30	70.3	15:00:30	65.7
14:51:00	65.1	15:01:00	64.9
14:51:30	64.9	15:01:30	65.9
14:52:00	65.3	15:02:00	66.7
14:52:30	62.6	15:02:30	67
14:53:00	65.4	15:03:00	66.2
14:53:30	65.9	15:03:30	66
14:54:00	67	15:04:00	65.9
14:54:30	67.6	15:04:30	66.2
14:55:00	64.5	15:05:00	68.2
14:55:30	65.4	15:05:30	65.4
14:56:00	64.9	15:06:00	66.5
14:56:30	66.6	15:06:30	65.3

Leq (dBA)
66.3

SITE SKETCH:

North Arrow

Site Specifics

Pavement Type:	Grade:	Site Surface:	Employee:
asphalt	Above	soft	ERZ, LMG

Atmospheric Conditions :
fair, light wind (2-3 mph wind),40o F

APPENDIX B -
NOISE METER PRINTOUTS

****
Filename.....TMS2-1
Test Location.....271 Point Circle
Employee Name.....ERZ
Employee Number.....
Department.....ENV
North York Widening

Calibrator Type.....MS CL304 SN 4480
Calibrator Cal. Date...4-26-18
****

METROSONICS db-3080 V1.12 SERIAL # 3895
REPORT PRINTED ON 12/12/18 at 11:51:32

User ID: _____

LOGGING STARTED.....12/11/18 at 09:59:30
TOTAL LOGGING TIME...0 DAYS 00:58:19
LOGGING STOPPED.....12/11/18 at 10:57:49
TOTAL INTERVALS.....117
INTERVAL LENGTH.....00:00:30

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....SLOW
FILTER.....A WT.

PRE-TEST CALIBRATION TIME....12/11/18 AT 08:46:07
PRE-TEST CALIBRATION RANGE...39.9 TO 139.9 dB
POST-TEST CALIBRATION NOT DONE
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 63.7dB
Lav (80)..... 39.9dB
Lav (90)..... 39.9dB

SEL..... 99.0dB

TWA..... 54.5dB
TWA (80)..... 39.9dB
TWA (90)..... 39.9dB

Lmax..... 72.9dB 12/11/18 at 10:52:18
Lpk.....UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)..... 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
12/11/18					
09:59:30	63.6	65.2	UNDER	64.9	61.9
10:00:00	62.9	64.8	UNDER	64.9	60.9
10:00:30	61.6	64.4	UNDER	63.9	59.9
10:01:00	63.9	65.8	UNDER	65.9	61.9
10:01:30	63.8	66.3	UNDER	65.9	60.9
10:02:00	64.3	66.8	UNDER	66.9	62.9
10:02:30	63.2	64.8	UNDER	64.9	60.9
10:03:00	62.3	65.1	UNDER	64.9	59.9
10:03:30	64.0	64.8	UNDER	64.9	62.9
10:04:00	63.3	65.0	UNDER	64.9	61.9
10:04:30	60.9	63.2	UNDER	62.9	56.9
10:05:00	63.0	64.8	UNDER	64.9	60.9
10:05:30	60.5	63.0	UNDER	62.9	58.9
10:06:00	65.3	68.0	UNDER	67.9	62.9
10:06:30	65.3	68.0	UNDER	67.9	62.9
10:07:00	63.5	66.8	UNDER	66.9	60.9
10:07:30	64.3	67.6	UNDER	65.9	61.9
10:08:00	66.5	71.2	UNDER	68.9	64.9
10:08:30	63.0	66.0	UNDER	65.9	59.9
10:09:00	63.2	65.2	UNDER	64.9	60.9
10:09:30	63.5	65.6	UNDER	65.9	61.9
10:10:00	63.4	65.2	UNDER	64.9	60.9
10:10:30	62.1	65.0	UNDER	64.9	59.9
10:11:00	63.8	65.6	UNDER	65.9	60.9
10:11:30	63.7	66.0	UNDER	65.9	60.9
10:12:00	62.6	64.2	UNDER	64.9	61.9
10:12:30	63.1	65.0	UNDER	64.9	60.9
10:13:00	65.6	68.0	UNDER	67.9	63.9
10:13:30	64.9	67.6	UNDER	66.9	62.9
10:14:00	64.7	66.2	UNDER	65.9	63.9
10:14:30	65.1	70.3	UNDER	69.9	60.9
10:15:00	66.6	68.2	UNDER	67.9	62.9
10:15:30	63.8	66.7	UNDER	65.9	61.9

10:16:00	65.2	68.2	UNDER	67.9	61.9
10:16:30	62.6	64.0	UNDER	63.9	60.9
10:17:00	63.6	65.6	UNDER	64.9	61.9
10:17:30	61.9	64.4	UNDER	64.9	59.9
10:18:00	64.8	66.5	UNDER	66.9	63.9
10:18:30	63.0	66.0	UNDER	65.9	59.9
10:19:00	64.0	66.4	UNDER	66.9	59.9
10:19:30	63.3	65.1	UNDER	64.9	58.9
10:20:00	62.4	64.8	UNDER	64.9	59.9
10:20:30	63.6	65.2	UNDER	64.9	62.9
10:21:00	64.3	65.7	UNDER	65.9	62.9
10:21:30	64.7	66.1	UNDER	65.9	62.9
10:22:00	63.3	65.6	UNDER	64.9	60.9
10:22:30	63.3	65.6	UNDER	65.9	60.9
10:23:00	64.2	65.2	UNDER	65.9	63.9
10:23:30	64.1	65.9	UNDER	65.9	62.9
10:24:00	63.4	64.8	UNDER	64.9	61.9
10:24:30	62.8	64.7	UNDER	64.9	59.9
10:25:00	62.3	64.8	UNDER	64.9	56.9
10:25:30	62.3	65.9	UNDER	65.9	55.9
10:26:00	64.1	66.4	UNDER	66.9	61.9
10:26:30	64.3	67.2	UNDER	66.9	60.9
10:27:00	61.1	63.2	UNDER	62.9	59.9
10:27:30	62.9	65.9	UNDER	65.9	57.9
10:28:00	61.7	65.6	UNDER	64.9	59.9
10:28:30	63.6	65.2	UNDER	64.9	60.9
10:29:00	64.1	65.2	UNDER	65.9	62.9
10:29:30	63.9	65.2	UNDER	65.9	62.9
10:30:00	61.8	64.0	UNDER	63.9	59.9
10:30:30	62.6	64.4	UNDER	63.9	58.9
10:31:00	63.1	65.2	UNDER	64.9	58.9
10:31:30	63.7	66.4	UNDER	66.9	58.9
10:32:00	61.7	64.8	UNDER	63.9	58.9
10:32:30	65.2	66.4	UNDER	66.9	62.9
10:33:00	64.4	67.2	UNDER	66.9	59.9
10:33:30	63.6	65.6	UNDER	65.9	61.9
10:34:00	62.3	64.0	UNDER	63.9	60.9
10:34:30	64.1	66.4	UNDER	65.9	60.9
10:35:00	61.7	63.5	UNDER	62.9	60.9
10:35:30	61.0	64.1	UNDER	62.9	57.9
10:36:00	63.3	64.8	UNDER	64.9	60.9
10:36:30	64.7	67.5	UNDER	66.9	61.9
10:37:00	61.1	62.8	UNDER	62.9	57.9
10:37:30	64.0	68.0	UNDER	66.9	60.9
10:38:00	64.6	67.5	UNDER	66.9	61.9
10:38:30	63.2	64.8	UNDER	64.9	61.9
10:39:00	63.1	64.4	UNDER	64.9	62.9
10:39:30	63.5	64.9	UNDER	64.9	62.9
10:40:00	65.3	69.2	UNDER	68.9	60.9
10:40:30	63.8	67.7	UNDER	65.9	62.9
10:41:00	65.2	70.4	UNDER	68.9	60.9
10:41:30	65.4	67.5	UNDER	66.9	63.9
10:42:00	62.4	64.4	UNDER	63.9	59.9
10:42:30	63.6	66.0	UNDER	65.9	60.9

10:43:00	63.4	65.7	UNDER	65.9	60.9
10:43:30	63.0	65.9	UNDER	65.9	61.9
10:44:00	63.5	65.6	UNDER	65.9	59.9
10:44:30	62.8	65.1	UNDER	64.9	59.9
10:45:00	63.4	64.5	UNDER	64.9	62.9
10:45:30	63.0	64.4	UNDER	64.9	61.9
10:46:00	64.1	67.6	UNDER	66.9	60.9
10:46:30	63.7	65.6	UNDER	65.9	61.9
10:47:00	62.5	64.3	UNDER	63.9	60.9
10:47:30	64.2	66.4	UNDER	66.9	61.9
10:48:00	63.8	65.2	UNDER	65.9	61.9
10:48:30	61.2	62.7	UNDER	62.9	59.9
10:49:00	63.9	65.7	UNDER	64.9	61.9
10:49:30	64.7	67.2	UNDER	66.9	59.9
10:50:00	62.2	65.6	UNDER	64.9	59.9
10:50:30	60.8	62.6	UNDER	62.9	58.9
10:51:00	65.7	69.2	UNDER	68.9	61.9
10:51:30	64.2	66.9	UNDER	66.9	60.9
10:52:00	66.6	72.9	UNDER	70.9	60.9
10:52:30	64.6	65.6	UNDER	65.9	63.9
10:53:00	62.3	64.0	UNDER	64.9	60.9
10:53:30	61.9	63.6	UNDER	63.9	59.9
10:54:00	63.7	66.0	UNDER	65.9	61.9
10:54:30	64.2	65.6	UNDER	65.9	61.9
10:55:00	62.9	64.0	UNDER	63.9	61.9
10:55:30	62.8	65.6	UNDER	65.9	58.9
10:56:00	63.5	65.3	UNDER	65.9	61.9
10:56:30	63.2	65.2	UNDER	64.9	61.9
10:57:00	63.3	65.2	UNDER	64.9	62.9
10:57:30	64.5	66.0	UNDER	65.9	63.9

****
Filename.....TMS2-2
Test Location.....222 Arsenal Rd
Employee Name.....ERZ
Employee Number.....
Department.....ENV
North York Widening
Jalaram Temple

Calibrator Type.....MS CL304 SN 4480
Calibrator Cal. Date...4-26-18
****

METROSONICS db-3080 V1.20 SERIAL # 5093
REPORT PRINTED ON 12/12/18 at 11:51:38

User ID: _____

LOGGING STARTED.....12/11/18 at 10:11:30
TOTAL LOGGING TIME...0 DAYS 00:53:27
LOGGING STOPPED.....12/11/18 at 11:04:57
TOTAL INTERVALS.....107
INTERVAL LENGTH.....00:00:30

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....SLOW
FILTER.....A WT.

PRE-TEST CALIBRATION TIME....12/11/18 AT 08:46:54
PRE-TEST CALIBRATION RANGE...41.0 TO 141.0 dB
POST-TEST CALIBRATION NOT DONE
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 65.8dB
Lav (80)..... 55.3dB
Lav (90)..... 41.0dB

SEL..... 100.8dB

TWA..... 56.3dB
TWA (80)..... 45.8dB
TWA (90)..... 41.0dB

Lmax..... 86.1dB 12/11/18 at 10:16:04
Lpk.....UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)..... 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
12/11/18					
10:11:30	66.1	69.7	UNDER	68.0	60.0
10:12:00	63.3	68.8	UNDER	66.0	56.0
10:12:30	64.8	70.3	UNDER	68.0	56.0
10:13:00	69.0	75.2	UNDER	73.0	63.0
10:13:30	65.9	69.6	UNDER	68.0	60.0
10:14:00	63.2	67.0	UNDER	65.0	59.0
10:14:30	59.4	65.3	UNDER	64.0	54.0
10:15:00	71.7	79.7	UNDER	76.0	61.0
10:15:30	66.5	75.2	UNDER	70.0	56.0
10:16:00	76.4	86.1	UNDER	82.0	61.0
10:16:30	64.9	68.1	UNDER	67.0	61.0
10:17:00	64.1	69.8	UNDER	68.0	53.0
10:17:30	61.4	66.4	UNDER	64.0	53.0
10:18:00	64.3	67.0	UNDER	66.0	61.0
10:18:30	65.6	70.9	UNDER	69.0	61.0
10:19:00	64.7	69.3	UNDER	67.0	59.0
10:19:30	63.7	69.7	UNDER	69.0	56.0
10:20:00	61.3	64.1	UNDER	63.0	57.0
10:20:30	63.6	68.7	UNDER	66.0	56.0
10:21:00	66.8	70.3	UNDER	69.0	61.0
10:21:30	64.9	69.3	UNDER	68.0	57.0
10:22:00	64.3	68.5	UNDER	67.0	58.0
10:22:30	64.5	68.5	UNDER	67.0	58.0
10:23:00	67.5	69.6	UNDER	68.0	64.0
10:23:30	66.0	71.2	UNDER	69.0	57.0
10:24:00	63.9	69.3	UNDER	67.0	57.0
10:24:30	65.6	72.4	UNDER	68.0	56.0
10:25:00	58.9	61.8	UNDER	60.0	56.0
10:25:30	65.0	68.8	UNDER	67.0	56.0
10:26:00	67.0	71.2	UNDER	70.0	60.0
10:26:30	62.8	66.9	UNDER	66.0	55.0
10:27:00	60.5	64.0	UNDER	62.0	56.0
10:27:30	67.8	72.8	UNDER	71.0	59.0

10:28:00	62.7	66.7	UNDER	65.0	56.0
10:28:30	61.4	67.7	UNDER	67.0	54.0
10:29:00	62.0	65.4	UNDER	64.0	59.0
10:29:30	64.4	66.9	UNDER	66.0	60.0
10:30:00	62.4	65.6	UNDER	65.0	57.0
10:30:30	65.0	68.8	UNDER	67.0	59.0
10:31:00	65.0	69.5	UNDER	67.0	58.0
10:31:30	61.4	64.4	UNDER	63.0	57.0
10:32:00	59.0	64.7	UNDER	63.0	54.0
10:32:30	68.2	72.8	UNDER	71.0	61.0
10:33:00	62.8	66.5	UNDER	65.0	58.0
10:33:30	63.9	66.4	UNDER	65.0	60.0
10:34:00	61.5	64.1	UNDER	62.0	56.0
10:34:30	62.5	68.3	UNDER	66.0	53.0
10:35:00	65.7	68.8	UNDER	68.0	60.0
10:35:30	63.6	70.1	UNDER	67.0	56.0
10:36:00	62.7	66.9	UNDER	66.0	55.0
10:36:30	67.0	72.4	UNDER	71.0	58.0
10:37:00	62.8	68.8	UNDER	65.0	56.0
10:37:30	65.0	70.8	UNDER	69.0	52.0
10:38:00	66.1	71.5	UNDER	69.0	61.0
10:38:30	64.2	69.5	UNDER	67.0	56.0
10:39:00	64.4	68.5	UNDER	67.0	57.0
10:39:30	65.0	67.7	UNDER	67.0	60.0
10:40:00	67.4	73.6	UNDER	71.0	59.0
10:40:30	69.0	77.7	UNDER	74.0	58.0
10:41:00	64.6	70.9	UNDER	66.0	58.0
10:41:30	68.6	74.8	UNDER	71.0	59.0
10:42:00	62.3	66.0	UNDER	65.0	55.0
10:42:30	68.6	75.5	UNDER	74.0	58.0
10:43:00	67.6	73.3	UNDER	72.0	54.0
10:43:30	63.3	68.8	UNDER	65.0	55.0
10:44:00	63.4	68.5	UNDER	66.0	58.0
10:44:30	63.5	67.2	UNDER	65.0	60.0
10:45:00	65.2	68.8	UNDER	68.0	58.0
10:45:30	60.8	63.3	UNDER	62.0	56.0
10:46:00	67.2	74.0	UNDER	72.0	58.0
10:46:30	68.7	76.5	UNDER	74.0	56.0
10:47:00	63.6	68.3	UNDER	67.0	56.0
10:47:30	64.1	67.7	UNDER	66.0	56.0
10:48:00	65.9	70.5	UNDER	69.0	56.0
10:48:30	62.6	66.6	UNDER	65.0	58.0
10:49:00	68.0	74.9	UNDER	72.0	57.0
10:49:30	63.1	66.0	UNDER	65.0	56.0
10:50:00	64.2	68.9	UNDER	67.0	59.0
10:50:30	63.3	70.5	UNDER	67.0	54.0
10:51:00	68.8	74.4	UNDER	71.0	61.0
10:51:30	64.8	71.2	UNDER	66.0	61.0
10:52:00	72.5	79.6	UNDER	77.0	61.0
10:52:30	63.9	67.1	UNDER	65.0	60.0
10:53:00	65.8	68.9	UNDER	68.0	60.0
10:53:30	65.4	70.4	UNDER	69.0	56.0
10:54:00	61.6	66.4	UNDER	63.0	57.0
10:54:30	63.6	66.0	UNDER	65.0	59.0

10:55:00	65.6	67.7	UNDER	67.0	61.0
10:55:30	64.8	68.5	UNDER	67.0	59.0
10:56:00	63.7	67.3	UNDER	66.0	60.0
10:56:30	65.8	70.4	UNDER	69.0	58.0
10:57:00	65.4	69.7	UNDER	66.0	62.0
10:57:30	64.3	67.9	UNDER	66.0	57.0
10:58:00	61.7	65.3	UNDER	64.0	57.0
10:58:30	65.6	72.5	UNDER	70.0	56.0
10:59:00	65.8	67.9	UNDER	67.0	63.0
10:59:30	66.0	70.5	UNDER	69.0	60.0
11:00:00	62.6	68.0	UNDER	66.0	55.0
11:00:30	65.0	70.7	UNDER	69.0	55.0
11:01:00	65.8	69.6	UNDER	67.0	62.0
11:01:30	64.2	69.3	UNDER	68.0	59.0
11:02:00	69.4	75.7	UNDER	74.0	61.0
11:02:30	63.9	69.3	UNDER	67.0	56.0
11:03:00	64.5	69.1	UNDER	67.0	57.0
11:03:30	63.4	66.0	UNDER	65.0	56.0
11:04:00	64.4	71.2	UNDER	68.0	56.0
11:04:30	60.6	65.6	UNDER	64.0	54.0

****
Filename.....TMS2-3
Test Location.....222 Arsenal Rd
Employee Name.....ERZ
Employee Number.....
Department.....ENV
Econolodge
North York Widening
12-11-18

Calibrator Type.....MS CL304 SN 4480
Calibrator Cal. Date...4-26-18
****

METROSONICS db-3080 V1.12 SERIAL # 3897
REPORT PRINTED ON 12/12/18 at 11:51:44

User ID: _____

LOGGING STARTED.....12/11/18 at 10:20:00
TOTAL LOGGING TIME...0 DAYS 00:38:40
LOGGING STOPPED.....12/11/18 at 10:58:40
TOTAL INTERVALS.....78
INTERVAL LENGTH.....00:00:30

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....SLOW
FILTER.....A WT.

PRE-TEST CALIBRATION TIME....12/11/18 AT 08:47:36
PRE-TEST CALIBRATION RANGE...40.2 TO 140.2 dB
POST-TEST CALIBRATION NOT DONE
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 67.5dB
Lav (80)..... 40.2dB
Lav (90)..... 40.2dB

SEL..... 101.1dB

TWA..... 56.6dB
TWA (80)..... 40.2dB
TWA (90)..... 40.2dB

Lmax..... 78.3dB 12/11/18 at 10:52:40
Lpk.....UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)..... 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
12/11/18					
10:20:00	65.3	69.3	UNDER	67.2	60.2
10:20:30	69.7	76.7	UNDER	72.2	65.2
10:21:00	68.3	72.7	UNDER	71.2	64.2
10:21:30	66.8	69.4	UNDER	68.2	64.2
10:22:00	66.2	69.2	UNDER	68.2	63.2
10:22:30	67.8	70.8	UNDER	70.2	63.2
10:23:00	69.7	72.1	UNDER	71.2	67.2
10:23:30	67.9	71.8	UNDER	69.2	64.2
10:24:00	66.7	68.7	UNDER	68.2	63.2
10:24:30	65.3	69.5	UNDER	68.2	59.2
10:25:00	63.5	68.3	UNDER	67.2	60.2
10:25:30	68.2	75.4	UNDER	70.2	63.2
10:26:00	69.8	75.0	UNDER	73.2	65.2
10:26:30	63.8	67.9	UNDER	66.2	61.2
10:27:00	66.3	75.5	UNDER	68.2	61.2
10:27:30	70.6	76.1	UNDER	72.2	68.2
10:28:00	66.9	69.5	UNDER	69.2	62.2
10:28:30	61.2	64.7	UNDER	62.2	59.2
10:29:00	64.1	66.4	UNDER	65.2	60.2
10:29:30	67.0	68.4	UNDER	67.2	64.2
10:30:00	66.0	68.7	UNDER	67.2	63.2
10:30:30	67.6	71.4	UNDER	70.2	63.2
10:31:00	68.3	72.2	UNDER	70.2	62.2
10:31:30	62.2	64.4	UNDER	64.2	59.2
10:32:00	67.3	71.4	UNDER	71.2	62.2
10:32:30	70.4	73.5	UNDER	72.2	63.2
10:33:00	66.6	69.4	UNDER	68.2	62.2
10:33:30	66.1	67.5	UNDER	67.2	62.2
10:34:00	63.3	65.9	UNDER	64.2	62.2
10:34:30	66.8	70.3	UNDER	69.2	62.2
10:35:00	67.2	69.5	UNDER	69.2	64.2
10:35:30	64.1	66.9	UNDER	65.2	59.2
10:36:00	65.9	70.1	UNDER	67.2	59.2

10:36:30	67.8	72.3	UNDER	71.2	62.2
10:37:00	64.7	67.9	UNDER	67.2	60.2
10:37:30	69.6	72.3	UNDER	71.2	63.2
10:38:00	67.1	71.1	UNDER	68.2	63.2
10:38:30	64.8	67.9	UNDER	67.2	60.2
10:39:00	68.2	70.7	UNDER	69.2	63.2
10:39:30	66.5	68.7	UNDER	67.2	63.2
10:40:00	69.2	72.4	UNDER	71.2	64.2
10:40:30	69.4	75.1	UNDER	73.2	61.2
10:41:00	68.5	72.7	UNDER	70.2	64.2
10:41:30	69.3	72.3	UNDER	71.2	66.2
10:42:00	67.1	73.9	UNDER	68.2	60.2
10:42:30	66.4	73.7	UNDER	69.2	62.2
10:43:00	67.3	71.5	UNDER	70.2	61.2
10:43:30	65.3	67.1	UNDER	66.2	61.2
10:44:00	66.5	68.7	UNDER	68.2	63.2
10:44:30	67.5	69.5	UNDER	69.2	63.2
10:45:00	65.9	68.3	UNDER	67.2	62.2
10:45:30	64.7	71.5	UNDER	67.2	61.2
10:46:00	71.0	76.7	UNDER	74.2	66.2
10:46:30	67.9	69.9	UNDER	69.2	65.2
10:47:00	67.0	69.5	UNDER	68.2	61.2
10:47:30	67.7	70.6	UNDER	69.2	63.2
10:48:00	66.8	69.7	UNDER	68.2	63.2
10:48:30	64.9	67.5	UNDER	67.2	61.2
10:49:00	70.8	75.1	UNDER	73.2	65.2
10:49:30	67.9	70.7	UNDER	69.2	65.2
10:50:00	64.6	66.8	UNDER	66.2	61.2
10:50:30	66.7	70.1	UNDER	69.2	62.2
10:51:00	68.0	70.7	UNDER	69.2	65.2
10:51:30	69.8	76.2	UNDER	73.2	65.2
10:52:00	71.0	76.3	UNDER	74.2	64.2
10:52:30	71.0	78.3	UNDER	75.2	63.2
10:53:00	66.9	71.5	UNDER	69.2	61.2
10:53:30	68.0	71.4	UNDER	70.2	61.2
10:54:00	65.5	69.5	UNDER	67.2	61.2
10:54:30	66.6	70.0	UNDER	68.2	62.2
10:55:00	66.9	70.3	UNDER	69.2	61.2
10:55:30	66.1	69.3	UNDER	68.2	62.2
10:56:00	65.6	68.5	UNDER	67.2	62.2
10:56:30	70.4	75.9	UNDER	74.2	66.2
10:57:00	67.6	73.7	UNDER	69.2	64.2
10:57:30	64.9	67.9	UNDER	67.2	60.2
10:58:00	64.8	68.3	UNDER	65.2	63.2
10:58:30	69.9	74.7	UNDER	73.2	63.2

****
Filename.....TMS3-2
Test Location.....1550 Eleventh Ave
Employee Name.....ERZ
Employee Number.....
Department.....ENV
North York Widening

Calibrator Type.....MS CL304 SN 4480
Calibrator Cal. Date...4-26-18
****

METROSONICS db-3080 V1.20 SERIAL # 5093
REPORT PRINTED ON 12/12/18 at 11:51:55

User ID: _____

LOGGING STARTED.....12/11/18 at 11:17:30
TOTAL LOGGING TIME...0 DAYS 00:28:56
LOGGING STOPPED.....12/11/18 at 11:46:26
TOTAL INTERVALS.....58
INTERVAL LENGTH.....00:00:30

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....SLOW
FILTER.....A WT.

PRE-TEST CALIBRATION TIME....12/11/18 AT 08:46:54
PRE-TEST CALIBRATION RANGE...41.0 TO 141.0 dB
POST-TEST CALIBRATION NOT DONE
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 67.9dB
Lav (80)..... 41.0dB
Lav (90)..... 41.0dB

SEL..... 100.2dB

TWA..... 55.7dB
TWA (80)..... 41.0dB
TWA (90)..... 41.0dB

Lmax..... 73.9dB 12/11/18 at 11:38:00
Lpk.....UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)..... 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
12/11/18					
11:17:30	66.3	68.4	UNDER	68.0	63.0
11:18:00	68.7	72.5	UNDER	71.0	65.0
11:18:30	68.4	70.9	UNDER	70.0	63.0
11:19:00	68.0	70.1	UNDER	69.0	63.0
11:19:30	65.5	67.9	UNDER	66.0	63.0
11:20:00	65.5	68.7	UNDER	68.0	62.0
11:20:30	68.0	70.5	UNDER	69.0	63.0
11:21:00	68.5	72.7	UNDER	72.0	62.0
11:21:30	67.7	70.5	UNDER	70.0	64.0
11:22:00	67.2	69.3	UNDER	68.0	64.0
11:22:30	66.0	69.2	UNDER	68.0	63.0
11:23:00	65.8	69.1	UNDER	67.0	63.0
11:23:30	67.3	70.8	UNDER	69.0	62.0
11:24:00	67.1	68.3	UNDER	67.0	65.0
11:24:30	68.8	72.5	UNDER	72.0	64.0
11:25:00	68.9	73.3	UNDER	70.0	65.0
11:25:30	68.7	71.5	UNDER	70.0	65.0
11:26:00	67.0	69.7	UNDER	68.0	64.0
11:26:30	65.8	69.8	UNDER	68.0	60.0
11:27:00	67.6	73.6	UNDER	71.0	61.0
11:27:30	67.6	70.9	UNDER	70.0	64.0
11:28:00	67.9	70.7	UNDER	70.0	62.0
11:28:30	67.8	70.9	UNDER	70.0	64.0
11:29:00	65.8	67.3	UNDER	66.0	63.0
11:29:30	67.7	72.5	UNDER	71.0	61.0
11:30:00	70.0	73.3	UNDER	72.0	66.0
11:30:30	67.3	72.3	UNDER	70.0	63.0
11:31:00	67.9	69.7	UNDER	69.0	64.0
11:31:30	68.4	73.6	UNDER	72.0	64.0
11:32:00	67.6	69.6	UNDER	69.0	66.0
11:32:30	67.0	70.8	UNDER	68.0	65.0
11:33:00	65.9	68.3	UNDER	68.0	59.0
11:33:30	67.1	69.7	UNDER	68.0	59.0

11:34:00	68.4	69.7	UNDER	69.0	66.0
11:34:30	67.2	69.1	UNDER	68.0	65.0
11:35:00	66.2	69.2	UNDER	68.0	64.0
11:35:30	68.9	71.5	UNDER	70.0	65.0
11:36:00	68.9	70.9	UNDER	70.0	65.0
11:36:30	67.4	69.9	UNDER	69.0	65.0
11:37:00	66.7	69.7	UNDER	68.0	64.0
11:37:30	69.3	73.7	UNDER	72.0	65.0
11:38:00	70.0	73.9	UNDER	71.0	65.0
11:38:30	67.4	70.0	UNDER	69.0	64.0
11:39:00	67.2	69.7	UNDER	68.0	65.0
11:39:30	69.0	70.4	UNDER	70.0	66.0
11:40:00	68.6	69.7	UNDER	69.0	66.0
11:40:30	67.7	73.3	UNDER	69.0	63.0
11:41:00	67.9	72.1	UNDER	69.0	65.0
11:41:30	68.9	72.2	UNDER	71.0	65.0
11:42:00	66.9	69.3	UNDER	68.0	65.0
11:42:30	67.7	70.1	UNDER	69.0	65.0
11:43:00	68.1	70.4	UNDER	69.0	64.0
11:43:30	67.5	71.6	UNDER	70.0	61.0
11:44:00	66.2	69.3	UNDER	68.0	61.0
11:44:30	69.7	72.7	UNDER	71.0	67.0
11:45:00	69.8	72.1	UNDER	71.0	66.0
11:45:30	69.9	73.7	UNDER	72.0	65.0
11:46:00	68.7	70.5	UNDER	70.0	65.0

****
Filename.....TMS4-1
Test Location.....69 North Yale St
Employee Name.....ERZ
Employee Number.....
Department.....ENV
North York Widening

Calibrator Type.....MS CL304 SN 4480
Calibrator Cal. Date...4-26-18
****

METROSONICS db-3080 V1.12 SERIAL # 3895
REPORT PRINTED ON 12/12/18 at 11:52:07

User ID: _____

LOGGING STARTED.....12/11/18 at 12:37:30
TOTAL LOGGING TIME...0 DAYS 00:54:30
LOGGING STOPPED.....12/11/18 at 13:32:00
TOTAL INTERVALS.....109
INTERVAL LENGTH.....00:00:30

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....SLOW
FILTER.....A WT.

PRE-TEST CALIBRATION TIME....12/11/18 AT 08:46:07
PRE-TEST CALIBRATION RANGE...39.9 TO 139.9 dB
POST-TEST CALIBRATION NOT DONE
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 64.8dB
Lav (80)..... 56.3dB
Lav (90)..... 39.9dB

SEL..... 99.8dB

TWA..... 55.4dB
TWA (80)..... 46.8dB
TWA (90)..... 39.9dB

Lmax..... 85.2dB 12/11/18 at 13:16:15
Lpk.....UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)..... 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
12/11/18					
12:37:30	63.9	71.6	UNDER	69.9	56.9
12:38:00	63.9	71.6	UNDER	67.9	57.9
12:38:30	62.3	68.8	UNDER	67.9	53.9
12:39:00	61.1	65.6	UNDER	64.9	53.9
12:39:30	62.8	68.4	UNDER	66.9	58.9
12:40:00	64.3	70.1	UNDER	67.9	58.9
12:40:30	62.1	67.2	UNDER	64.9	56.9
12:41:00	64.8	69.6	UNDER	69.9	58.9
12:41:30	69.7	79.2	UNDER	75.9	59.9
12:42:00	61.3	64.4	UNDER	63.9	57.9
12:42:30	68.8	75.6	UNDER	74.9	61.9
12:43:00	66.1	69.2	UNDER	68.9	60.9
12:43:30	63.2	66.7	UNDER	65.9	58.9
12:44:00	57.3	61.7	UNDER	59.9	54.9
12:44:30	68.8	76.6	UNDER	74.9	55.9
12:45:00	63.6	68.4	UNDER	66.9	56.9
12:45:30	63.6	68.0	UNDER	67.9	55.9
12:46:00	62.9	66.8	UNDER	66.9	58.9
12:46:30	60.4	64.0	UNDER	62.9	56.9
12:47:00	60.7	64.6	UNDER	64.9	57.9
12:47:30	67.9	76.0	UNDER	73.9	58.9
12:48:00	66.6	71.0	UNDER	69.9	60.9
12:48:30	66.5	74.4	UNDER	71.9	60.9
12:49:00	62.5	68.9	UNDER	65.9	56.9
12:49:30	63.8	68.4	UNDER	67.9	56.9
12:50:00	65.9	71.6	UNDER	69.9	56.9
12:50:30	61.6	66.8	UNDER	65.9	56.9
12:51:00	61.0	63.2	UNDER	62.9	58.9
12:51:30	60.0	64.8	UNDER	64.9	55.9
12:52:00	64.7	70.0	UNDER	68.9	58.9
12:52:30	67.8	71.6	UNDER	70.9	60.9
12:53:00	63.3	66.8	UNDER	64.9	60.9
12:53:30	63.9	69.6	UNDER	66.9	55.9

12:54:00	61.6	64.0	UNDER	63.9	55.9
12:54:30	61.3	64.0	UNDER	63.9	58.9
12:55:00	62.8	64.8	UNDER	64.9	60.9
12:55:30	65.0	69.6	UNDER	67.9	62.9
12:56:00	68.2	71.3	UNDER	70.9	62.9
12:56:30	59.9	70.3	UNDER	62.9	54.9
12:57:00	65.8	71.2	UNDER	70.9	57.9
12:57:30	67.9	75.2	UNDER	72.9	60.9
12:58:00	64.5	69.6	UNDER	68.9	60.9
12:58:30	60.8	66.4	UNDER	62.9	53.9
12:59:00	64.1	71.2	UNDER	69.9	50.9
12:59:30	59.9	62.3	UNDER	61.9	57.9
13:00:00	62.9	67.2	UNDER	66.9	58.9
13:00:30	64.7	68.3	UNDER	67.9	59.9
13:01:00	65.8	72.5	UNDER	71.9	59.9
13:01:30	59.1	61.7	UNDER	60.9	56.9
13:02:00	61.8	67.6	UNDER	65.9	54.9
13:02:30	61.0	64.4	UNDER	63.9	58.9
13:03:00	60.2	64.9	UNDER	63.9	55.9
13:03:30	67.0	75.2	UNDER	69.9	60.9
13:04:00	68.3	76.8	UNDER	72.9	61.9
13:04:30	64.0	69.4	UNDER	68.9	57.9
13:05:00	64.9	72.8	UNDER	69.9	58.9
13:05:30	65.0	72.4	UNDER	70.9	58.9
13:06:00	60.7	64.5	UNDER	63.9	56.9
13:06:30	62.0	69.1	UNDER	65.9	54.9
13:07:00	61.8	68.4	UNDER	65.9	58.9
13:07:30	60.2	63.3	UNDER	62.9	56.9
13:08:00	60.7	68.0	UNDER	64.9	56.9
13:08:30	64.3	72.2	UNDER	69.9	57.9
13:09:00	62.2	68.3	UNDER	66.9	56.9
13:09:30	63.1	71.3	UNDER	66.9	58.9
13:10:00	62.4	68.8	UNDER	66.9	57.9
13:10:30	60.2	63.8	UNDER	62.9	56.9
13:11:00	63.1	66.8	UNDER	66.9	56.9
13:11:30	62.7	67.6	UNDER	65.9	59.9
13:12:00	65.5	69.6	UNDER	68.9	55.9
13:12:30	56.7	59.2	UNDER	58.9	53.9
13:13:00	57.9	61.2	UNDER	59.9	54.9
13:13:30	66.9	72.9	UNDER	71.9	56.9
13:14:00	65.4	70.0	UNDER	69.9	57.9
13:14:30	62.8	68.0	UNDER	67.9	56.9
13:15:00	62.4	68.8	UNDER	67.9	54.9
13:15:30	65.0	72.0	UNDER	70.9	56.9
13:16:00	77.3	85.2	UNDER	83.9	60.9
13:16:30	61.2	64.0	UNDER	62.9	58.9
13:17:00	64.0	68.4	UNDER	67.9	59.9
13:17:30	60.9	65.6	UNDER	64.9	57.9
13:18:00	61.0	66.0	UNDER	64.9	57.9
13:18:30	59.7	65.6	UNDER	64.9	53.9
13:19:00	63.3	68.0	UNDER	66.9	57.9
13:19:30	61.6	66.4	UNDER	65.9	54.9
13:20:00	63.6	68.8	UNDER	66.9	58.9
13:20:30	59.2	67.2	UNDER	61.9	54.9

13:21:00	65.8	72.0	UNDER	70.9	56.9
13:21:30	64.5	69.6	UNDER	68.9	56.9
13:22:00	61.7	64.8	UNDER	63.9	58.9
13:22:30	62.2	68.0	UNDER	63.9	60.9
13:23:00	61.2	68.0	UNDER	64.9	57.9
13:23:30	58.7	61.6	UNDER	60.9	56.9
13:24:00	59.8	61.6	UNDER	61.9	57.9
13:24:30	67.7	75.7	UNDER	73.9	57.9
13:25:00	61.3	67.2	UNDER	66.9	53.9
13:25:30	67.3	76.0	UNDER	72.9	59.9
13:26:00	62.3	68.4	UNDER	66.9	58.9
13:26:30	63.8	68.8	UNDER	67.9	57.9
13:27:00	62.2	70.8	UNDER	64.9	56.9
13:27:30	69.2	75.3	UNDER	74.9	59.9
13:28:00	59.6	66.1	UNDER	63.9	54.9
13:28:30	63.5	68.8	UNDER	66.9	57.9
13:29:00	63.4	67.2	UNDER	66.9	57.9
13:29:30	65.0	71.7	UNDER	70.9	58.9
13:30:00	58.1	63.2	UNDER	60.9	54.9
13:30:30	58.6	63.2	UNDER	60.9	56.9
13:31:00	63.4	67.1	UNDER	65.9	59.9
13:31:30	63.9	72.0	UNDER	68.9	55.9

****
Filename.....TMS4-2
Test Location.....28 North Belmont St
Employee Name.....ERZ
Employee Number.....
Department.....ENV
North York Widening

Calibrator Type.....MS CL304 SN 4480
Calibrator Cal. Date...4-26-18
****

METROSONICS db-3080 V1.20 SERIAL # 5093
REPORT PRINTED ON 12/12/18 at 11:52:15

User ID: _____

LOGGING STARTED.....12/11/18 at 12:42:30
TOTAL LOGGING TIME...0 DAYS 00:47:18
LOGGING STOPPED.....12/11/18 at 13:29:48
TOTAL INTERVALS.....95
INTERVAL LENGTH.....00:00:30

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....SLOW
FILTER.....A WT.

PRE-TEST CALIBRATION TIME....12/11/18 AT 08:46:54
PRE-TEST CALIBRATION RANGE...41.0 TO 141.0 dB
POST-TEST CALIBRATION NOT DONE
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 62.2dB
Lav (80)..... 41.0dB
Lav (90)..... 41.0dB

SEL..... 96.6dB

TWA..... 52.1dB
TWA (80)..... 41.0dB
TWA (90)..... 41.0dB

Lmax..... 77.9dB 12/11/18 at 13:26:08
Lpk.....UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)..... 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
12/11/18					
12:42:30	59.8	62.6	UNDER	61.0	57.0
12:43:00	59.2	62.5	UNDER	61.0	56.0
12:43:30	63.3	68.8	UNDER	65.0	59.0
12:44:00	65.1	69.3	UNDER	67.0	57.0
12:44:30	60.6	64.7	UNDER	63.0	56.0
12:45:00	59.9	63.7	UNDER	62.0	55.0
12:45:30	59.8	63.2	UNDER	61.0	56.0
12:46:00	60.7	64.8	UNDER	62.0	57.0
12:46:30	58.9	63.3	UNDER	60.0	56.0
12:47:00	59.8	61.3	UNDER	60.0	56.0
12:47:30	59.9	62.5	UNDER	61.0	56.0
12:48:00	61.5	64.8	UNDER	63.0	57.0
12:48:30	59.4	62.8	UNDER	61.0	56.0
12:49:00	67.9	74.4	UNDER	72.0	58.0
12:49:30	63.5	68.8	UNDER	66.0	58.0
12:50:00	62.7	66.5	UNDER	65.0	59.0
12:50:30	59.1	60.8	UNDER	60.0	55.0
12:51:00	61.1	66.6	UNDER	65.0	55.0
12:51:30	60.7	64.9	UNDER	63.0	55.0
12:52:00	61.2	67.6	UNDER	64.0	56.0
12:52:30	64.9	68.6	UNDER	67.0	60.0
12:53:00	62.5	66.8	UNDER	65.0	58.0
12:53:30	63.7	69.2	UNDER	66.0	57.0
12:54:00	63.6	68.3	UNDER	66.0	57.0
12:54:30	59.9	62.9	UNDER	62.0	57.0
12:55:00	60.7	63.3	UNDER	61.0	58.0
12:55:30	63.5	68.1	UNDER	65.0	59.0
12:56:00	62.6	67.7	UNDER	65.0	59.0
12:56:30	61.9	64.4	UNDER	63.0	58.0
12:57:00	62.2	67.8	UNDER	66.0	56.0
12:57:30	63.5	67.2	UNDER	66.0	57.0
12:58:00	60.3	62.6	UNDER	61.0	58.0
12:58:30	60.6	63.2	UNDER	62.0	57.0

12:59:00	56.9	60.4	UNDER	58.0	53.0
12:59:30	63.8	68.8	UNDER	66.0	59.0
13:00:00	59.6	65.6	UNDER	62.0	55.0
13:00:30	60.4	63.6	UNDER	62.0	56.0
13:01:00	61.9	69.0	UNDER	66.0	56.0
13:01:30	59.7	63.9	UNDER	61.0	56.0
13:02:00	59.6	62.9	UNDER	61.0	57.0
13:02:30	59.9	62.0	UNDER	61.0	57.0
13:03:00	58.5	61.9	UNDER	60.0	54.0
13:03:30	61.8	66.8	UNDER	64.0	57.0
13:04:00	62.6	67.6	UNDER	65.0	59.0
13:04:30	62.2	68.4	UNDER	65.0	56.0
13:05:00	58.5	61.6	UNDER	60.0	56.0
13:05:30	61.0	65.9	UNDER	64.0	56.0
13:06:00	66.4	75.3	UNDER	70.0	58.0
13:06:30	59.8	65.7	UNDER	62.0	55.0
13:07:00	60.6	64.4	UNDER	62.0	56.0
13:07:30	63.6	68.4	UNDER	66.0	59.0
13:08:00	62.2	68.9	UNDER	64.0	57.0
13:08:30	61.1	65.2	UNDER	64.0	56.0
13:09:00	66.4	74.4	UNDER	71.0	58.0
13:09:30	61.6	67.3	UNDER	65.0	56.0
13:10:00	63.4	71.1	UNDER	68.0	56.0
13:10:30	61.9	66.5	UNDER	65.0	56.0
13:11:00	60.4	64.2	UNDER	62.0	56.0
13:11:30	62.5	66.8	UNDER	65.0	58.0
13:12:00	61.7	65.6	UNDER	64.0	57.0
13:12:30	58.5	62.8	UNDER	60.0	56.0
13:13:00	58.7	64.5	UNDER	59.0	56.0
13:13:30	62.4	66.8	UNDER	66.0	57.0
13:14:00	62.8	67.7	UNDER	64.0	58.0
13:14:30	65.0	68.4	UNDER	67.0	59.0
13:15:00	60.0	65.6	UNDER	63.0	56.0
13:15:30	64.6	72.5	UNDER	69.0	55.0
13:16:00	58.7	62.4	UNDER	60.0	56.0
13:16:30	61.3	65.2	UNDER	63.0	56.0
13:17:00	66.6	68.8	UNDER	68.0	63.0
13:17:30	65.0	70.0	UNDER	68.0	59.0
13:18:00	59.6	64.4	UNDER	60.0	58.0
13:18:30	57.1	60.4	UNDER	59.0	53.0
13:19:00	61.1	64.6	UNDER	62.0	58.0
13:19:30	61.8	67.2	UNDER	65.0	57.0
13:20:00	59.9	63.3	UNDER	61.0	56.0
13:20:30	62.8	69.1	UNDER	66.0	56.0
13:21:00	59.1	63.7	UNDER	62.0	55.0
13:21:30	60.1	63.3	UNDER	62.0	55.0
13:22:00	60.6	64.9	UNDER	63.0	55.0
13:22:30	60.5	63.3	UNDER	63.0	57.0
13:23:00	59.6	63.8	UNDER	62.0	56.0
13:23:30	60.1	63.6	UNDER	62.0	57.0
13:24:00	60.6	63.6	UNDER	63.0	57.0
13:24:30	61.7	66.4	UNDER	64.0	56.0
13:25:00	59.8	64.8	UNDER	62.0	54.0
13:25:30	59.5	66.0	UNDER	63.0	54.0

13:26:00	69.5	77.9	UNDER	74.0	60.0
13:26:30	62.0	65.3	UNDER	63.0	58.0
13:27:00	59.5	63.2	UNDER	60.0	57.0
13:27:30	62.4	65.6	UNDER	65.0	58.0
13:28:00	61.6	66.4	UNDER	64.0	55.0
13:28:30	61.3	67.2	UNDER	65.0	57.0
13:29:00	62.9	69.9	UNDER	67.0	56.0
13:29:30	61.8	69.3	UNDER	62.0	58.0

****
Filename.....TMS4-3
Test Location.....54 North Oxford St
Employee Name.....ERZ
Employee Number.....
Department.....ENV
54 North Oxford St

Calibrator Type.....Metrosonics CL304 SN4480
Calibrator Cal. Date...4-26-18
****

METROSONICS db-3080 V1.12 SERIAL # 3895
REPORT PRINTED ON 03/28/19 at 09:36:34

User ID: _____

LOGGING STARTED.....03/27/19 at 15:01:30
TOTAL LOGGING TIME...0 DAYS 00:26:20
LOGGING STOPPED.....03/27/19 at 15:27:50
TOTAL INTERVALS.....53
INTERVAL LENGTH.....00:00:30

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....SLOW
FILTER.....A WT.

PRE-TEST CALIBRATION TIME....03/27/19 AT 14:22:38
PRE-TEST CALIBRATION RANGE...40.3 TO 140.3 dB
POST-TEST CALIBRATION TIME...03/28/19 AT 09:18:53
POST-TEST CALIBRATION RANGE...40.1 TO 140.1
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 66.3dB
Lav (80)..... 40.3dB

Lav (90)..... 40.3dB
SEL..... 98.2dB

TWA..... 53.8dB
TWA (80)..... 40.3dB
TWA (90)..... 40.3dB

Lmax..... 76.4dB 03/27/19 at 15:25:09
Lpk.....UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)..... 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
03/27/19					
15:01:30	67.1	73.2	UNDER	70.3	60.3
15:02:00	66.0	69.6	UNDER	69.3	56.3
15:02:30	64.5	67.0	UNDER	66.3	61.3
15:03:00	61.5	64.0	UNDER	62.3	59.3
15:03:30	63.2	65.2	UNDER	64.3	59.3
15:04:00	68.3	73.6	UNDER	70.3	61.3
15:04:30	71.1	76.4	UNDER	74.3	65.3
15:05:00	65.9	71.2	UNDER	68.3	62.3
15:05:30	64.3	66.4	UNDER	65.3	61.3
15:06:00	67.2	71.6	UNDER	70.3	61.3
15:06:30	63.9	66.0	UNDER	65.3	62.3
15:07:00	64.9	70.0	UNDER	67.3	60.3
15:07:30	62.5	67.2	UNDER	65.3	59.3
15:08:00	65.4	68.8	UNDER	67.3	61.3
15:08:30	68.2	71.6	UNDER	71.3	61.3
15:09:00	67.8	70.0	UNDER	69.3	64.3
15:09:30	66.7	72.0	UNDER	70.3	61.3
15:10:00	63.8	66.0	UNDER	64.3	62.3
15:10:30	66.5	70.7	UNDER	69.3	62.3
15:11:00	65.3	68.5	UNDER	67.3	58.3
15:11:30	63.8	71.5	UNDER	65.3	60.3
15:12:00	67.0	72.8	UNDER	70.3	62.3
15:12:30	63.6	66.0	UNDER	65.3	60.3
15:13:00	66.2	70.0	UNDER	69.3	62.3
15:13:30	65.8	69.7	UNDER	68.3	62.3
15:14:00	68.2	73.7	UNDER	73.3	61.3
15:14:30	63.5	66.0	UNDER	65.3	61.3
15:15:00	64.0	67.3	UNDER	66.3	59.3
15:15:30	67.7	69.6	UNDER	69.3	63.3
15:16:00	67.4	73.2	UNDER	70.3	58.3
15:16:30	68.1	74.2	UNDER	72.3	59.3
15:17:00	64.9	67.1	UNDER	66.3	62.3

15:17:30	66.1	70.8	UNDER	68.3	62.3
15:18:00	67.7	75.2	UNDER	71.3	61.3
15:18:30	66.2	71.6	UNDER	69.3	62.3
15:19:00	63.1	67.3	UNDER	66.3	55.3
15:19:30	62.2	64.8	UNDER	64.3	58.3
15:20:00	68.5	73.6	UNDER	72.3	60.3
15:20:30	66.8	70.4	UNDER	69.3	60.3
15:21:00	62.9	67.3	UNDER	64.3	58.3
15:21:30	64.9	70.4	UNDER	68.3	59.3
15:22:00	63.8	71.6	UNDER	69.3	55.3
15:22:30	67.2	72.4	UNDER	71.3	60.3
15:23:00	66.8	72.4	UNDER	68.3	63.3
15:23:30	66.2	68.8	UNDER	68.3	62.3
15:24:00	62.6	66.0	UNDER	64.3	58.3
15:24:30	65.2	68.8	UNDER	67.3	60.3
15:25:00	71.8	76.4	UNDER	73.3	66.3
15:25:30	64.6	67.4	UNDER	66.3	60.3
15:26:00	64.3	70.3	UNDER	67.3	59.3
15:26:30	64.5	68.4	UNDER	66.3	62.3
15:27:00	66.9	70.0	UNDER	68.3	63.3
15:27:30	69.9	74.1	UNDER	73.3	67.3

****
Filename.....TMS4-6
Test Location.....1775 East Market St
Employee Name.....ERZ
Employee Number.....
Department.....ENV
North York Widening
Advent Lutheran Church

Calibrator Type.....MS CL304 SN 4480
Calibrator Cal. Date...4-26-18
****

METROSONICS db-3080 V1.20 SERIAL # 4618
REPORT PRINTED ON 12/12/18 at 11:52:29

User ID: _____

LOGGING STARTED.....12/11/18 at 12:49:00
TOTAL LOGGING TIME...0 DAYS 00:49:15
LOGGING STOPPED.....12/11/18 at 13:38:15
TOTAL INTERVALS.....99
INTERVAL LENGTH.....00:00:30

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....SLOW
FILTER.....A WT.

PRE-TEST CALIBRATION TIME....12/11/18 AT 08:48:49
PRE-TEST CALIBRATION RANGE...40.1 TO 140.1 dB
POST-TEST CALIBRATION NOT DONE
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 63.6dB
Lav (80)..... 40.1dB
Lav (90)..... 40.1dB

SEL..... 98.2dB

TWA..... 53.8dB
TWA (80)..... 40.1dB
TWA (90)..... 40.1dB

Lmax..... 75.6dB 12/11/18 at 13:24:17
Lpk.....UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)..... 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
12/11/18					
12:49:00	65.4	70.6	UNDER	67.1	62.1
12:49:30	63.7	66.7	UNDER	66.1	60.1
12:50:00	62.1	63.5	UNDER	63.1	59.1
12:50:30	62.7	66.8	UNDER	65.1	58.1
12:51:00	63.4	65.6	UNDER	64.1	61.1
12:51:30	62.3	65.4	UNDER	64.1	60.1
12:52:00	67.8	73.9	UNDER	71.1	62.1
12:52:30	64.0	67.9	UNDER	65.1	61.1
12:53:00	64.2	66.7	UNDER	65.1	62.1
12:53:30	63.0	64.9	UNDER	64.1	61.1
12:54:00	63.4	67.2	UNDER	66.1	61.1
12:54:30	63.6	67.0	UNDER	66.1	61.1
12:55:00	64.2	66.4	UNDER	65.1	62.1
12:55:30	63.8	65.1	UNDER	64.1	62.1
12:56:00	61.0	63.0	UNDER	62.1	59.1
12:56:30	61.2	62.4	UNDER	62.1	60.1
12:57:00	61.0	63.4	UNDER	62.1	59.1
12:57:30	63.7	65.0	UNDER	64.1	61.1
12:58:00	63.2	65.1	UNDER	64.1	60.1
12:58:30	61.1	64.0	UNDER	63.1	59.1
12:59:00	64.0	67.0	UNDER	65.1	62.1
12:59:30	64.7	69.2	UNDER	67.1	61.1
13:00:00	65.0	67.8	UNDER	66.1	62.1
13:00:30	61.9	63.7	UNDER	63.1	59.1
13:01:00	62.7	64.2	UNDER	63.1	61.1
13:01:30	61.3	64.0	UNDER	63.1	59.1
13:02:00	61.2	63.5	UNDER	63.1	58.1
13:02:30	61.7	63.6	UNDER	63.1	59.1
13:03:00	63.5	66.4	UNDER	65.1	61.1
13:03:30	61.8	63.4	UNDER	62.1	60.1
13:04:00	61.4	63.5	UNDER	62.1	60.1
13:04:30	63.7	65.9	UNDER	65.1	61.1
13:05:00	62.7	65.6	UNDER	65.1	59.1

13:05:30	64.1	65.6	UNDER	65.1	62.1
13:06:00	61.6	64.0	UNDER	63.1	59.1
13:06:30	61.7	65.2	UNDER	64.1	59.1
13:07:00	63.7	65.3	UNDER	64.1	61.1
13:07:30	61.9	63.4	UNDER	62.1	60.1
13:08:00	62.0	63.8	UNDER	62.1	60.1
13:08:30	62.4	65.6	UNDER	63.1	61.1
13:09:00	63.4	66.7	UNDER	65.1	60.1
13:09:30	65.2	68.2	UNDER	66.1	62.1
13:10:00	64.3	66.7	UNDER	66.1	61.1
13:10:30	62.9	64.5	UNDER	63.1	61.1
13:11:00	64.3	68.9	UNDER	66.1	60.1
13:11:30	65.0	66.8	UNDER	66.1	63.1
13:12:00	62.6	66.0	UNDER	64.1	60.1
13:12:30	62.4	64.4	UNDER	63.1	60.1
13:13:00	63.3	65.6	UNDER	64.1	61.1
13:13:30	66.6	70.4	UNDER	69.1	63.1
13:14:00	67.5	73.6	UNDER	71.1	62.1
13:14:30	65.9	69.8	UNDER	67.1	63.1
13:15:00	65.4	74.4	UNDER	66.1	60.1
13:15:30	62.0	64.0	UNDER	63.1	60.1
13:16:00	64.0	70.8	UNDER	66.1	60.1
13:16:30	64.1	70.8	UNDER	66.1	60.1
13:17:00	64.8	66.1	UNDER	65.1	63.1
13:17:30	64.2	65.8	UNDER	65.1	61.1
13:18:00	60.5	62.2	UNDER	61.1	58.1
13:18:30	63.6	67.0	UNDER	65.1	60.1
13:19:00	62.8	64.8	UNDER	64.1	60.1
13:19:30	63.6	66.4	UNDER	65.1	61.1
13:20:00	64.1	66.3	UNDER	65.1	62.1
13:20:30	63.4	66.0	UNDER	64.1	61.1
13:21:00	63.1	65.8	UNDER	64.1	61.1
13:21:30	62.2	63.9	UNDER	63.1	60.1
13:22:00	64.3	69.8	UNDER	67.1	61.1
13:22:30	62.4	64.8	UNDER	64.1	60.1
13:23:00	63.6	65.3	UNDER	65.1	60.1
13:23:30	64.5	67.8	UNDER	65.1	63.1
13:24:00	65.9	75.6	UNDER	67.1	60.1
13:24:30	63.5	66.4	UNDER	65.1	60.1
13:25:00	62.9	64.8	UNDER	64.1	60.1
13:25:30	66.4	69.4	UNDER	68.1	64.1
13:26:00	63.2	65.0	UNDER	64.1	61.1
13:26:30	64.5	66.4	UNDER	65.1	63.1
13:27:00	63.6	66.2	UNDER	65.1	60.1
13:27:30	63.3	68.1	UNDER	65.1	60.1
13:28:00	65.5	71.4	UNDER	67.1	63.1
13:28:30	61.7	63.4	UNDER	62.1	60.1
13:29:00	62.9	65.6	UNDER	65.1	61.1
13:29:30	62.0	65.3	UNDER	64.1	59.1
13:30:00	62.7	66.0	UNDER	63.1	60.1
13:30:30	62.4	64.9	UNDER	63.1	60.1
13:31:00	62.1	64.1	UNDER	63.1	59.1
13:31:30	63.1	73.0	UNDER	64.1	59.1
13:32:00	62.1	63.9	UNDER	63.1	60.1

13:32:30	64.1	67.1	UNDER	65.1	61.1
13:33:00	63.3	65.0	UNDER	64.1	60.1
13:33:30	63.4	66.2	UNDER	65.1	60.1
13:34:00	62.0	64.0	UNDER	63.1	58.1
13:34:30	63.3	65.9	UNDER	64.1	61.1
13:35:00	63.3	66.0	UNDER	65.1	60.1
13:35:30	61.9	64.4	UNDER	63.1	60.1
13:36:00	64.2	66.8	UNDER	65.1	62.1
13:36:30	64.6	67.7	UNDER	67.1	62.1
13:37:00	63.7	65.8	UNDER	65.1	61.1
13:37:30	63.1	65.2	UNDER	64.1	61.1
13:38:00	64.9	66.4	UNDER	65.1	63.1

****
Filename.....TMS5-1
Test Location.....1871 3rd Ave
Employee Name.....ERZ
Employee Number.....
Department.....ENV
North York Widening

Calibrator Type.....MS CL304 SN 4480
Calibrator Cal. Date...4-26-18
****

METROSONICS db-3080 V1.12 SERIAL # 3895
REPORT PRINTED ON 12/12/18 at 11:52:40

User ID: _____

LOGGING STARTED.....12/11/18 at 13:47:30
TOTAL LOGGING TIME...0 DAYS 00:44:04
LOGGING STOPPED.....12/11/18 at 14:31:34
TOTAL INTERVALS.....89
INTERVAL LENGTH.....00:00:30

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....SLOW
FILTER.....A WT.

PRE-TEST CALIBRATION TIME....12/11/18 AT 08:46:07
PRE-TEST CALIBRATION RANGE...39.9 TO 139.9 dB
POST-TEST CALIBRATION NOT DONE
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 67.5dB
Lav (80)..... 50.9dB
Lav (90)..... 39.9dB

SEL..... 101.6dB

TWA..... 57.1dB
TWA (80)..... 40.5dB
TWA (90)..... 39.9dB

Lmax..... 85.9dB 12/11/18 at 14:31:32
Lpk..... 112.5dB 12/11/18 at 14:31:32
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)..... 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
12/11/18					
13:47:30	68.3	74.1	UNDER	72.9	58.9
13:48:00	67.5	71.3	UNDER	70.9	63.9
13:48:30	69.4	72.8	UNDER	72.9	63.9
13:49:00	67.7	69.6	UNDER	69.9	64.9
13:49:30	65.9	70.8	UNDER	69.9	60.9
13:50:00	66.3	70.0	UNDER	68.9	59.9
13:50:30	68.8	72.4	UNDER	71.9	64.9
13:51:00	68.0	70.8	UNDER	70.9	61.9
13:51:30	65.5	70.9	UNDER	70.9	57.9
13:52:00	66.5	74.4	UNDER	68.9	62.9
13:52:30	68.7	74.0	UNDER	71.9	62.9
13:53:00	70.7	74.4	UNDER	73.9	63.9
13:53:30	66.6	70.4	UNDER	69.9	63.9
13:54:00	67.3	70.8	UNDER	70.9	62.9
13:54:30	65.7	70.4	UNDER	69.9	60.9
13:55:00	67.0	72.8	UNDER	71.9	59.9
13:55:30	68.9	73.6	UNDER	72.9	65.9
13:56:00	68.5	71.3	UNDER	70.9	63.9
13:56:30	69.0	73.2	UNDER	71.9	62.9
13:57:00	67.5	72.0	UNDER	70.9	58.9
13:57:30	69.2	72.9	UNDER	72.9	61.9
13:58:00	68.0	71.2	UNDER	70.9	64.9
13:58:30	65.2	70.0	UNDER	68.9	61.9
13:59:00	68.5	72.3	UNDER	71.9	61.9
13:59:30	67.1	70.8	UNDER	70.9	63.9
14:00:00	68.7	72.8	UNDER	71.9	63.9
14:00:30	65.1	67.6	UNDER	66.9	62.9
14:01:00	68.0	70.4	UNDER	69.9	62.9
14:01:30	66.7	69.1	UNDER	68.9	62.9
14:02:00	67.3	72.0	UNDER	71.9	60.9
14:02:30	66.4	70.5	UNDER	70.9	56.9
14:03:00	69.0	71.6	UNDER	71.9	63.9
14:03:30	63.0	68.0	UNDER	66.9	56.9

14:04:00	64.7	67.6	UNDER	66.9	59.9
14:04:30	67.5	71.2	UNDER	70.9	60.9
14:05:00	65.4	68.4	UNDER	66.9	63.9
14:05:30	67.3	70.4	UNDER	69.9	65.9
14:06:00	67.6	72.6	UNDER	69.9	64.9
14:06:30	65.1	68.4	UNDER	66.9	61.9
14:07:00	66.8	68.8	UNDER	68.9	63.9
14:07:30	66.6	70.0	UNDER	68.9	63.9
14:08:00	64.2	68.8	UNDER	67.9	57.9
14:08:30	68.1	74.0	UNDER	72.9	62.9
14:09:00	67.6	71.2	UNDER	70.9	64.9
14:09:30	65.6	70.0	UNDER	68.9	60.9
14:10:00	64.8	68.8	UNDER	68.9	60.9
14:10:30	65.8	70.4	UNDER	69.9	56.9
14:11:00	67.7	70.8	UNDER	69.9	57.9
14:11:30	66.6	72.4	UNDER	69.9	62.9
14:12:00	67.3	72.4	UNDER	70.9	61.9
14:12:30	68.8	74.1	UNDER	72.9	62.9
14:13:00	67.5	70.0	UNDER	69.9	61.9
14:13:30	66.9	70.8	UNDER	68.9	60.9
14:14:00	65.9	68.8	UNDER	67.9	60.9
14:14:30	67.8	70.8	UNDER	69.9	63.9
14:15:00	65.5	69.5	UNDER	68.9	60.9
14:15:30	66.6	70.0	UNDER	68.9	62.9
14:16:00	66.1	70.8	UNDER	69.9	61.9
14:16:30	66.8	71.9	UNDER	70.9	61.9
14:17:00	65.9	70.2	UNDER	69.9	62.9
14:17:30	67.4	70.8	UNDER	69.9	64.9
14:18:00	65.8	68.8	UNDER	67.9	62.9
14:18:30	65.2	69.3	UNDER	68.9	60.9
14:19:00	67.0	70.0	UNDER	69.9	62.9
14:19:30	72.1	78.0	UNDER	77.9	60.9
14:20:00	70.6	78.0	UNDER	75.9	64.9
14:20:30	69.0	73.5	UNDER	70.9	64.9
14:21:00	64.9	69.6	UNDER	67.9	60.9
14:21:30	67.7	72.8	UNDER	71.9	62.9
14:22:00	67.9	70.4	UNDER	69.9	63.9
14:22:30	65.6	68.4	UNDER	68.9	59.9
14:23:00	65.6	68.0	UNDER	67.9	61.9
14:23:30	67.9	70.8	UNDER	70.9	60.9
14:24:00	69.5	75.6	UNDER	74.9	63.9
14:24:30	68.5	71.0	UNDER	70.9	63.9
14:25:00	64.5	68.2	UNDER	67.9	62.9
14:25:30	69.8	75.2	UNDER	72.9	64.9
14:26:00	64.0	67.8	UNDER	66.9	58.9
14:26:30	67.0	74.4	UNDER	72.9	58.9
14:27:00	64.3	66.8	UNDER	66.9	60.9
14:27:30	65.2	69.2	UNDER	68.9	59.9
14:28:00	67.2	70.8	UNDER	69.9	62.9
14:28:30	65.7	69.6	UNDER	68.9	60.9
14:29:00	65.6	69.0	UNDER	67.9	63.9
14:29:30	64.8	68.4	UNDER	67.9	61.9
14:30:00	67.9	71.6	UNDER	69.9	64.9
14:30:30	66.9	72.8	UNDER	70.9	58.9

14:31:00	68.9	73.3	UNDER	72.9	66.9
14:31:30	79.6	85.9	112.5	84.9	67.9

****
Filename.....TMS5-2
Test Location.....150 South Manheim St
Employee Name.....ERZ
Employee Number.....
Department.....ENV
North York Widening
York Church of Christ

Calibrator Type.....MS CL304 SN 4480
Calibrator Cal. Date...4-26-18
****

METROSONICS db-3080 V1.20 SERIAL # 5093
REPORT PRINTED ON 12/12/18 at 11:52:46

User ID: _____

LOGGING STARTED.....12/11/18 at 13:52:00
TOTAL LOGGING TIME...0 DAYS 00:37:51
LOGGING STOPPED.....12/11/18 at 14:29:51
TOTAL INTERVALS.....76
INTERVAL LENGTH.....00:00:30

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....SLOW
FILTER.....A WT.

PRE-TEST CALIBRATION TIME....12/11/18 AT 08:46:54
PRE-TEST CALIBRATION RANGE...41.0 TO 141.0 dB
POST-TEST CALIBRATION NOT DONE
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 69.9dB
Lav (80)..... 51.7dB
Lav (90)..... 41.0dB

SEL..... 103.3dB

TWA..... 58.9dB
TWA (80)..... 41.0dB
TWA (90)..... 41.0dB

Lmax..... 83.1dB 12/11/18 at 13:59:18
Lpk.....UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)..... 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
12/11/18					
13:52:00	66.6	70.4	UNDER	69.0	61.0
13:52:30	71.9	76.4	UNDER	75.0	64.0
13:53:00	72.2	76.4	UNDER	75.0	66.0
13:53:30	71.3	73.7	UNDER	73.0	65.0
13:54:00	69.9	73.6	UNDER	72.0	65.0
13:54:30	69.2	73.3	UNDER	72.0	66.0
13:55:00	67.4	68.5	UNDER	68.0	65.0
13:55:30	70.3	74.9	UNDER	72.0	66.0
13:56:00	71.7	74.4	UNDER	73.0	68.0
13:56:30	70.4	72.9	UNDER	72.0	68.0
13:57:00	70.9	74.5	UNDER	73.0	66.0
13:57:30	71.9	76.1	UNDER	74.0	68.0
13:58:00	69.4	72.1	UNDER	71.0	66.0
13:58:30	70.0	74.5	UNDER	72.0	65.0
13:59:00	73.9	83.1	UNDER	78.0	65.0
13:59:30	71.3	74.5	UNDER	73.0	68.0
14:00:00	69.6	73.1	UNDER	72.0	66.0
14:00:30	69.0	73.2	UNDER	71.0	65.0
14:01:00	68.6	72.1	UNDER	70.0	64.0
14:01:30	69.6	71.8	UNDER	71.0	66.0
14:02:00	69.4	74.1	UNDER	72.0	65.0
14:02:30	68.6	72.4	UNDER	71.0	63.0
14:03:00	71.5	72.9	UNDER	72.0	68.0
14:03:30	70.3	74.0	UNDER	73.0	64.0
14:04:00	66.3	73.3	UNDER	68.0	62.0
14:04:30	68.5	73.6	UNDER	71.0	64.0
14:05:00	70.1	74.4	UNDER	72.0	64.0
14:05:30	69.1	71.7	UNDER	70.0	66.0
14:06:00	70.8	73.3	UNDER	72.0	68.0
14:06:30	67.9	70.4	UNDER	69.0	64.0
14:07:00	69.7	72.5	UNDER	71.0	66.0
14:07:30	68.4	71.2	UNDER	70.0	65.0
14:08:00	69.2	72.1	UNDER	70.0	66.0

14:08:30	68.6	74.5	UNDER	73.0	63.0
14:09:00	69.8	73.3	UNDER	72.0	65.0
14:09:30	68.7	71.7	UNDER	70.0	66.0
14:10:00	67.2	70.0	UNDER	69.0	64.0
14:10:30	68.0	71.0	UNDER	70.0	65.0
14:11:00	69.2	72.0	UNDER	70.0	65.0
14:11:30	69.4	72.8	UNDER	71.0	65.0
14:12:00	69.3	72.1	UNDER	71.0	66.0
14:12:30	70.3	74.9	UNDER	73.0	64.0
14:13:00	70.4	72.5	UNDER	72.0	66.0
14:13:30	70.5	72.6	UNDER	72.0	66.0
14:14:00	68.6	72.2	UNDER	71.0	62.0
14:14:30	71.1	72.4	UNDER	72.0	69.0
14:15:00	69.8	71.6	UNDER	71.0	66.0
14:15:30	71.2	73.6	UNDER	72.0	68.0
14:16:00	68.9	70.1	UNDER	69.0	66.0
14:16:30	68.8	72.3	UNDER	70.0	66.0
14:17:00	68.0	71.2	UNDER	70.0	65.0
14:17:30	69.8	71.2	UNDER	70.0	67.0
14:18:00	70.7	73.7	UNDER	72.0	67.0
14:18:30	68.1	72.0	UNDER	71.0	65.0
14:19:00	69.7	72.4	UNDER	71.0	66.0
14:19:30	68.6	71.7	UNDER	71.0	65.0
14:20:00	69.6	72.1	UNDER	71.0	65.0
14:20:30	71.9	74.8	UNDER	73.0	69.0
14:21:00	70.7	74.6	UNDER	73.0	65.0
14:21:30	68.7	76.0	UNDER	70.0	64.0
14:22:00	70.2	76.0	UNDER	72.0	66.0
14:22:30	69.5	71.2	UNDER	70.0	66.0
14:23:00	68.9	71.6	UNDER	70.0	64.0
14:23:30	69.3	72.2	UNDER	70.0	65.0
14:24:00	71.2	74.3	UNDER	72.0	68.0
14:24:30	69.7	72.5	UNDER	71.0	65.0
14:25:00	70.2	72.1	UNDER	71.0	67.0
14:25:30	70.4	74.5	UNDER	72.0	66.0
14:26:00	72.0	75.5	UNDER	74.0	68.0
14:26:30	64.8	68.5	UNDER	67.0	60.0
14:27:00	70.4	74.7	UNDER	73.0	63.0
14:27:30	68.4	71.9	UNDER	70.0	65.0
14:28:00	67.9	71.5	UNDER	70.0	65.0
14:28:30	69.6	72.5	UNDER	71.0	66.0
14:29:00	67.8	69.0	UNDER	68.0	66.0
14:29:30	68.1	70.1	UNDER	69.0	65.0

****
Filename.....TMS5-3
Test Location.....1834 Eastern Blvd
Employee Name.....ERZ
Employee Number.....
Department.....ENV
North York Widening

Calibrator Type.....MS CL304 SN 4480
Calibrator Cal. Date...4-26-18
****

METROSONICS db-3080 V1.12 SERIAL # 3897
REPORT PRINTED ON 12/12/18 at 11:52:55

User ID: _____

LOGGING STARTED.....12/11/18 at 13:54:30
TOTAL LOGGING TIME...0 DAYS 00:38:33
LOGGING STOPPED.....12/11/18 at 14:33:03
TOTAL INTERVALS.....78
INTERVAL LENGTH.....00:00:30

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....SLOW
FILTER.....A WT.

PRE-TEST CALIBRATION TIME....12/11/18 AT 08:47:36
PRE-TEST CALIBRATION RANGE...40.2 TO 140.2 dB
POST-TEST CALIBRATION TIME...12/11/18 AT 14:48:17
POST-TEST CALIBRATION RANGE...40.3 TO 140.3
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 65.7dB
Lav (80)..... 40.2dB

Lav (90)..... 40.2dB
SEL..... 99.3dB

TWA..... 54.8dB
TWA (80)..... 40.2dB
TWA (90)..... 40.2dB

Lmax..... 78.4dB 12/11/18 at 14:01:58
Lpk.....UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)..... 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
12/11/18					
13:54:30	65.8	69.5	UNDER	68.2	61.2
13:55:00	63.7	68.6	UNDER	65.2	61.2
13:55:30	64.4	66.7	UNDER	65.2	62.2
13:56:00	65.1	66.0	UNDER	65.2	63.2
13:56:30	64.4	67.3	UNDER	65.2	62.2
13:57:00	65.1	66.7	UNDER	66.2	62.2
13:57:30	65.9	69.3	UNDER	68.2	60.2
13:58:00	65.1	67.5	UNDER	66.2	60.2
13:58:30	68.9	74.6	UNDER	72.2	62.2
13:59:00	67.6	73.9	UNDER	69.2	63.2
13:59:30	68.0	73.9	UNDER	70.2	65.2
14:00:00	66.8	68.3	UNDER	67.2	65.2
14:00:30	65.4	67.9	UNDER	67.2	64.2
14:01:00	66.2	67.5	UNDER	67.2	64.2
14:01:30	72.3	78.4	UNDER	77.2	65.2
14:02:00	76.0	78.2	UNDER	77.2	73.2
14:02:30	70.2	73.5	UNDER	73.2	67.2
14:03:00	67.8	69.1	UNDER	68.2	66.2
14:03:30	64.9	68.7	UNDER	67.2	61.2
14:04:00	62.3	64.3	UNDER	64.2	60.2
14:04:30	64.2	67.1	UNDER	65.2	61.2
14:05:00	65.2	68.8	UNDER	67.2	62.2
14:05:30	64.5	67.5	UNDER	66.2	62.2
14:06:00	65.5	67.5	UNDER	67.2	62.2
14:06:30	63.0	65.7	UNDER	65.2	60.2
14:07:00	63.9	66.1	UNDER	65.2	60.2
14:07:30	62.7	65.7	UNDER	63.2	61.2
14:08:00	64.0	66.3	UNDER	65.2	61.2
14:08:30	65.5	69.5	UNDER	67.2	62.2
14:09:00	64.2	65.5	UNDER	64.2	63.2
14:09:30	64.9	66.3	UNDER	65.2	63.2
14:10:00	65.8	68.7	UNDER	67.2	63.2

14:10:30	65.0	66.1	UNDER	65.2	63.2
14:11:00	64.4	65.9	UNDER	65.2	63.2
14:11:30	63.8	66.3	UNDER	65.2	61.2
14:12:00	64.6	67.1	UNDER	66.2	61.2
14:12:30	67.0	70.1	UNDER	69.2	62.2
14:13:00	64.2	65.5	UNDER	65.2	62.2
14:13:30	64.9	67.5	UNDER	66.2	62.2
14:14:00	63.4	66.3	UNDER	65.2	58.2
14:14:30	65.4	67.9	UNDER	66.2	63.2
14:15:00	64.7	68.3	UNDER	67.2	62.2
14:15:30	64.2	66.1	UNDER	65.2	62.2
14:16:00	63.5	65.2	UNDER	64.2	61.2
14:16:30	63.7	66.6	UNDER	65.2	61.2
14:17:00	62.2	63.5	UNDER	63.2	60.2
14:17:30	63.6	65.2	UNDER	64.2	61.2
14:18:00	62.6	64.8	UNDER	64.2	61.2
14:18:30	63.5	65.2	UNDER	64.2	61.2
14:19:00	64.6	66.9	UNDER	66.2	61.2
14:19:30	62.3	65.0	UNDER	64.2	60.2
14:20:00	64.9	66.9	UNDER	66.2	63.2
14:20:30	66.4	67.5	UNDER	67.2	65.2
14:21:00	63.2	65.5	UNDER	64.2	61.2
14:21:30	64.7	66.3	UNDER	65.2	62.2
14:22:00	65.0	68.7	UNDER	67.2	61.2
14:22:30	62.6	64.0	UNDER	63.2	60.2
14:23:00	63.3	64.8	UNDER	64.2	60.2
14:23:30	63.7	65.9	UNDER	65.2	61.2
14:24:00	66.2	69.1	UNDER	68.2	62.2
14:24:30	65.0	67.5	UNDER	67.2	61.2
14:25:00	63.9	65.9	UNDER	65.2	62.2
14:25:30	63.8	65.9	UNDER	65.2	61.2
14:26:00	62.6	64.7	UNDER	64.2	57.2
14:26:30	61.3	66.3	UNDER	65.2	55.2
14:27:00	63.3	65.8	UNDER	65.2	60.2
14:27:30	61.7	64.2	UNDER	63.2	60.2
14:28:00	63.3	65.5	UNDER	64.2	60.2
14:28:30	63.4	65.9	UNDER	64.2	61.2
14:29:00	63.3	64.3	UNDER	64.2	62.2
14:29:30	61.9	63.6	UNDER	63.2	60.2
14:30:00	64.1	67.5	UNDER	65.2	60.2
14:30:30	63.8	65.6	UNDER	64.2	61.2
14:31:00	68.5	74.9	UNDER	72.2	64.2
14:31:30	63.0	66.1	UNDER	65.2	58.2
14:32:00	65.0	66.3	UNDER	66.2	62.2
14:32:30	64.0	67.0	UNDER	65.2	61.2
14:33:00	65.6	68.1	UNDER	67.2	61.2

****
Filename.....TMS5-6
Test Location.....1770 East Market St
Employee Name.....ERZ
Employee Number.....
Department.....ENV
North York Widening
Union Community Bank Mort
age Center

Calibrator Type.....MS CL304 SN 4480
Calibrator Cal. Date...4-26-18
****

METROSONICS db-3080 V1.20 SERIAL # 4618
REPORT PRINTED ON 12/12/18 at 11:53:02

User ID: _____

LOGGING STARTED.....12/11/18 at 14:03:30
TOTAL LOGGING TIME...0 DAYS 00:31:32
LOGGING STOPPED.....12/11/18 at 14:35:02
TOTAL INTERVALS.....64
INTERVAL LENGTH.....00:00:30

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....SLOW
FILTER.....A WT.

PRE-TEST CALIBRATION TIME....12/11/18 AT 08:48:49
PRE-TEST CALIBRATION RANGE...40.1 TO 140.1 dB
POST-TEST CALIBRATION TIME...12/11/18 AT 14:58:50
POST-TEST CALIBRATION RANGE...40.0 TO 140.0
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 66.6dB
Lav (80)..... 40.1dB

Lav (90)..... 40.1dB
SEL..... 99.2dB

TWA..... 54.8dB
TWA (80)..... 40.1dB
TWA (90)..... 40.1dB

Lmax..... 75.2dB 12/11/18 at 14:31:04
Lpk.....UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)..... 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
12/11/18					
14:03:30	63.3	66.0	UNDER	65.1	60.1
14:04:00	65.3	68.7	UNDER	66.1	62.1
14:04:30	67.7	71.8	UNDER	69.1	64.1
14:05:00	67.1	74.1	UNDER	70.1	62.1
14:05:30	66.4	68.3	UNDER	67.1	63.1
14:06:00	64.5	66.7	UNDER	66.1	61.1
14:06:30	64.3	67.6	UNDER	67.1	61.1
14:07:00	65.4	69.2	UNDER	67.1	63.1
14:07:30	66.8	70.7	UNDER	69.1	63.1
14:08:00	62.4	64.8	UNDER	64.1	58.1
14:08:30	67.4	70.4	UNDER	69.1	64.1
14:09:00	65.6	68.2	UNDER	67.1	62.1
14:09:30	64.9	67.4	UNDER	67.1	62.1
14:10:00	65.1	67.8	UNDER	67.1	61.1
14:10:30	65.6	68.4	UNDER	67.1	62.1
14:11:00	65.2	68.0	UNDER	66.1	61.1
14:11:30	66.7	71.4	UNDER	70.1	62.1
14:12:00	67.2	73.0	UNDER	70.1	62.1
14:12:30	68.4	73.3	UNDER	72.1	63.1
14:13:00	66.0	68.0	UNDER	67.1	63.1
14:13:30	65.1	68.2	UNDER	67.1	60.1
14:14:00	66.7	70.1	UNDER	68.1	64.1
14:14:30	68.0	70.8	UNDER	69.1	64.1
14:15:00	66.4	70.5	UNDER	68.1	63.1
14:15:30	65.7	69.9	UNDER	67.1	62.1
14:16:00	65.2	67.9	UNDER	67.1	63.1
14:16:30	66.0	68.5	UNDER	67.1	63.1
14:17:00	66.5	68.3	UNDER	67.1	63.1
14:17:30	66.8	69.0	UNDER	68.1	63.1
14:18:00	66.4	69.2	UNDER	68.1	63.1
14:18:30	66.4	69.1	UNDER	68.1	64.1
14:19:00	66.1	69.1	UNDER	67.1	62.1

14:19:30	66.3	69.8	UNDER	68.1	62.1
14:20:00	69.4	71.3	UNDER	70.1	65.1
14:20:30	67.9	70.8	UNDER	70.1	63.1
14:21:00	63.5	65.8	UNDER	64.1	61.1
14:21:30	67.6	72.5	UNDER	71.1	60.1
14:22:00	66.7	69.0	UNDER	68.1	62.1
14:22:30	65.8	68.1	UNDER	67.1	60.1
14:23:00	64.9	67.2	UNDER	66.1	62.1
14:23:30	69.1	74.2	UNDER	73.1	64.1
14:24:00	68.3	72.3	UNDER	70.1	65.1
14:24:30	66.8	69.5	UNDER	68.1	64.1
14:25:00	65.3	67.0	UNDER	66.1	63.1
14:25:30	66.1	67.8	UNDER	67.1	64.1
14:26:00	64.9	69.8	UNDER	66.1	59.1
14:26:30	67.7	72.2	UNDER	71.1	59.1
14:27:00	63.9	67.8	UNDER	66.1	61.1
14:27:30	64.4	68.0	UNDER	66.1	60.1
14:28:00	65.7	69.0	UNDER	68.1	61.1
14:28:30	65.2	67.2	UNDER	66.1	63.1
14:29:00	64.3	66.4	UNDER	65.1	62.1
14:29:30	62.5	64.1	UNDER	63.1	59.1
14:30:00	65.5	67.6	UNDER	67.1	63.1
14:30:30	68.0	72.1	UNDER	70.1	63.1
14:31:00	69.9	75.2	UNDER	74.1	64.1
14:31:30	66.7	71.0	UNDER	70.1	60.1
14:32:00	69.1	71.6	UNDER	70.1	66.1
14:32:30	64.7	66.6	UNDER	66.1	62.1
14:33:00	68.7	72.0	UNDER	71.1	64.1
14:33:30	69.0	75.1	UNDER	72.1	65.1
14:34:00	68.1	73.0	UNDER	71.1	64.1
14:34:30	68.2	72.8	UNDER	69.1	65.1
14:35:00	68.4	68.8	UNDER	68.1	68.1

****
Filename.....TMS6-1
Test Location.....400 Elmwood Blvd
Employee Name.....ERZ
Employee Number.....
Department.....ENV
North York Widening
Elmwood Mansion

Calibrator Type.....MS CL304 SN 4480
Calibrator Cal. Date...4-26-18
****

METROSONICS db-3080 V1.12 SERIAL # 3895
REPORT PRINTED ON 12/12/18 at 11:53:10

User ID: _____

LOGGING STARTED.....12/11/18 at 14:42:00
TOTAL LOGGING TIME...0 DAYS 00:30:31
LOGGING STOPPED.....12/11/18 at 15:12:31
TOTAL INTERVALS.....61
INTERVAL LENGTH.....00:00:30

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....SLOW
FILTER.....A WT.

PRE-TEST CALIBRATION TIME....12/11/18 AT 08:46:07
PRE-TEST CALIBRATION RANGE...39.9 TO 139.9 dB
POST-TEST CALIBRATION TIME...12/11/18 AT 16:45:49
POST-TEST CALIBRATION RANGE...39.9 TO 139.9
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 79.6dB
Lav (80)..... 79.5dB

Lav (90)..... 79.3dB
SEL..... 112.1dB

TWA..... 67.7dB
TWA (80)..... 67.5dB
TWA (90)..... 67.4dB

Lmax..... 110.0dB 12/11/18 at 15:12:20
Lpk.....OVER RANGE 12/11/18 at 15:12:20
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.55%
PROJ. DOSE (80).. 8.64%
DOSE (90)..... 0.53%
PROJ. DOSE (90).. 8.33%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
12/11/18					
14:42:00	66.6	68.0	UNDER	67.9	64.9
14:42:31	65.4	66.8	UNDER	66.9	64.9
14:43:02	64.8	68.4	UNDER	68.9	60.9
14:43:33	65.7	68.8	UNDER	68.9	62.9
14:44:04	61.9	63.6	UNDER	63.9	60.9
14:44:35	66.3	68.0	UNDER	67.9	62.9
14:45:06	63.3	65.2	UNDER	64.9	60.9
14:45:37	62.6	64.4	UNDER	64.9	60.9
14:46:08	62.8	66.0	UNDER	65.9	58.9
14:46:39	64.1	66.4	UNDER	65.9	62.9
14:47:10	66.2	69.2	UNDER	68.9	61.9
14:47:41	66.4	72.0	UNDER	68.9	62.9
14:48:12	69.0	75.2	UNDER	73.9	61.9
14:48:43	63.9	66.0	UNDER	65.9	61.9
14:49:14	68.0	72.6	UNDER	71.9	62.9
14:49:45	65.4	67.2	UNDER	66.9	63.9
14:50:16	69.3	73.2	UNDER	72.9	60.9
14:50:47	65.5	69.6	UNDER	67.9	63.9
14:51:18	63.9	66.0	UNDER	64.9	62.9
14:51:49	65.3	67.2	UNDER	66.9	61.9
14:52:20	62.3	64.6	UNDER	63.9	60.9
14:52:51	60.4	61.8	UNDER	60.9	59.9
14:53:22	63.5	65.2	UNDER	64.9	61.9
14:53:53	66.3	68.8	UNDER	68.9	64.9
14:54:24	66.5	70.0	UNDER	69.9	63.9
14:54:55	65.4	70.8	UNDER	69.9	61.9
14:55:26	64.8	65.9	UNDER	65.9	63.9
14:55:57	63.7	65.7	UNDER	64.9	61.9
14:56:28	64.6	66.8	UNDER	66.9	59.9
14:56:59	64.1	66.5	UNDER	66.9	60.9
14:57:30	61.5	64.1	UNDER	63.9	58.9
14:58:01	65.1	68.4	UNDER	67.9	61.9

14:58:32	62.0	63.6	UNDER	63.9	60.9
14:59:03	66.8	71.6	UNDER	69.9	62.9
14:59:34	65.0	66.8	UNDER	66.9	60.9
15:00:05	63.4	66.0	UNDER	65.9	60.9
15:00:36	63.1	65.4	UNDER	64.9	60.9
15:01:07	64.3	66.4	UNDER	66.9	61.9
15:01:38	64.1	67.0	UNDER	65.9	61.9
15:02:09	66.0	69.2	UNDER	68.9	63.9
15:02:40	70.4	77.6	UNDER	76.9	63.9
15:03:11	63.9	65.6	UNDER	65.9	61.9
15:03:42	65.6	68.5	UNDER	67.9	63.9
15:04:13	65.0	67.5	UNDER	66.9	62.9
15:04:44	65.5	67.6	UNDER	67.9	62.9
15:05:15	66.2	74.0	UNDER	66.9	63.9
15:05:46	68.9	74.8	UNDER	74.9	62.9
15:06:17	64.4	66.4	UNDER	65.9	62.9
15:06:48	64.6	67.5	UNDER	66.9	61.9
15:07:19	64.2	67.2	UNDER	65.9	62.9
15:07:50	67.1	72.0	UNDER	70.9	63.9
15:08:21	64.4	65.6	UNDER	65.9	62.9
15:08:52	63.0	64.4	UNDER	64.9	61.9
15:09:23	66.5	69.1	UNDER	68.9	60.9
15:09:54	67.0	69.2	UNDER	68.9	65.9
15:10:25	64.3	67.3	UNDER	66.9	60.9
15:10:56	64.6	66.5	UNDER	66.9	60.9
15:11:27	64.3	67.2	UNDER	66.9	61.9
15:11:58	64.9	66.0	UNDER	65.9	62.9
15:12:29	83.1	95.6	127.0	87.9	61.9
15:13:00	97.1	110.0	OVER	101.9	68.9

****
Filename.....TMS6-2
Test Location.....1759 3rd Ave
Employee Name.....ERZ
Employee Number.....
Department.....ENV
North York Widening
Elmwood Park

Calibrator Type.....MS CL304 SN 4480
Calibrator Cal. Date...4-26-18
****

METROSONICS db-3080 V1.20 SERIAL # 5093
REPORT PRINTED ON 12/12/18 at 11:53:16

User ID: _____

LOGGING STARTED.....12/11/18 at 14:45:30
TOTAL LOGGING TIME...0 DAYS 00:22:23
LOGGING STOPPED.....12/11/18 at 15:07:53
TOTAL INTERVALS.....45
INTERVAL LENGTH.....00:00:30

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....SLOW
FILTER.....A WT.

PRE-TEST CALIBRATION TIME....12/11/18 AT 08:46:54
PRE-TEST CALIBRATION RANGE...41.0 TO 141.0 dB
POST-TEST CALIBRATION TIME...12/11/18 AT 16:45:33
POST-TEST CALIBRATION RANGE...41.0 TO 141.0
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 66.2dB
Lav (80)..... 41.0dB

Lav (90)..... 41.0dB
SEL..... 97.4dB

TWA..... 52.9dB
TWA (80)..... 41.0dB
TWA (90)..... 41.0dB

Lmax..... 77.2dB 12/11/18 at 15:07:52
Lpk..... 111.6dB 12/11/18 at 15:07:52
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)..... 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
12/11/18					
14:45:30	63.2	66.0	UNDER	64.0	61.0
14:46:00	62.7	65.1	UNDER	64.0	60.0
14:46:30	65.2	67.7	UNDER	67.0	60.0
14:47:00	65.1	68.5	UNDER	68.0	60.0
14:47:30	68.0	71.7	UNDER	70.0	66.0
14:48:00	70.5	74.9	UNDER	73.0	65.0
14:48:30	64.0	67.7	UNDER	66.0	61.0
14:49:00	68.7	75.5	UNDER	74.0	62.0
14:49:30	67.1	73.6	UNDER	68.0	63.0
14:50:00	65.0	68.7	UNDER	66.0	60.0
14:50:30	70.3	76.5	UNDER	75.0	64.0
14:51:00	65.1	67.5	UNDER	66.0	62.0
14:51:30	64.9	68.8	UNDER	66.0	63.0
14:52:00	65.3	70.1	UNDER	68.0	60.0
14:52:30	62.6	64.3	UNDER	64.0	60.0
14:53:00	65.4	67.6	UNDER	66.0	61.0
14:53:30	65.9	68.1	UNDER	67.0	61.0
14:54:00	67.0	68.9	UNDER	68.0	63.0
14:54:30	67.6	70.9	UNDER	70.0	62.0
14:55:00	64.5	68.0	UNDER	66.0	62.0
14:55:30	65.4	67.6	UNDER	67.0	62.0
14:56:00	64.9	66.9	UNDER	66.0	60.0
14:56:30	66.6	68.1	UNDER	67.0	64.0
14:57:00	62.2	65.6	UNDER	64.0	59.0
14:57:30	65.7	70.5	UNDER	68.0	60.0
14:58:00	63.8	69.6	UNDER	65.0	60.0
14:58:30	65.4	70.5	UNDER	67.0	62.0
14:59:00	67.4	70.7	UNDER	70.0	64.0
14:59:30	64.9	67.3	UNDER	66.0	60.0
15:00:00	63.2	65.7	UNDER	64.0	60.0
15:00:30	65.7	67.6	UNDER	67.0	60.0
15:01:00	64.9	66.9	UNDER	66.0	62.0

15:01:30	65.9	68.8	UNDER	68.0	64.0
15:02:00	66.7	71.3	UNDER	68.0	64.0
15:02:30	67.0	72.1	UNDER	70.0	63.0
15:03:00	66.2	69.3	UNDER	66.0	64.0
15:03:30	66.0	69.2	UNDER	68.0	62.0
15:04:00	65.9	68.0	UNDER	67.0	63.0
15:04:30	66.2	68.9	UNDER	68.0	61.0
15:05:00	68.2	73.7	UNDER	72.0	64.0
15:05:30	65.4	69.2	UNDER	67.0	62.0
15:06:00	66.5	68.8	UNDER	67.0	64.0
15:06:30	65.3	68.9	UNDER	68.0	62.0
15:07:00	65.7	68.1	UNDER	67.0	62.0
15:07:30	68.2	77.2	111.6	69.0	62.0

APPENDIX C -
NOISE METER AND CALIBRATOR CALIBRATION CERTIFICATES

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

ACOUSTICAL CALIBRATOR

Manufactured by:	METROSONICS
Model No:	CL304
Serial No:	3616
Calibration Recall No:	28756

Submitted By:

Customer:	EVAN R. ZEIDERS
Company:	SKELLY & LOY, INC.
Address:	449 EISENHOWER BLVD., STE. 300
	HARRISBURG PA 17111

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. CL304 METR

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.
The information supplied relates to the calibrated item listed above.
West Caldwell Calibration Laboratories' calibration control system meets the requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2008 and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by: Fe

Felix Christopher (QA Mgr.)

Calibration Date: 26-Apr-18

Certificate No: 28756 - 5

ISO/IEC 17025:2005

ACCREDITED

Calibration Lab. Cert. # 1533.01

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor NY 14564

ISO/IEC 17025: 2005
ACCREDITED
Calibration Lab. Cert. # 1533.01

REPORT OF CALIBRATION

for

Metrosonics Acoustical Calibrator **Model No.: CL304** **Serial No.: 3616**
Company: Skelly & Loy, Inc. **I. D. No.: XXXX**

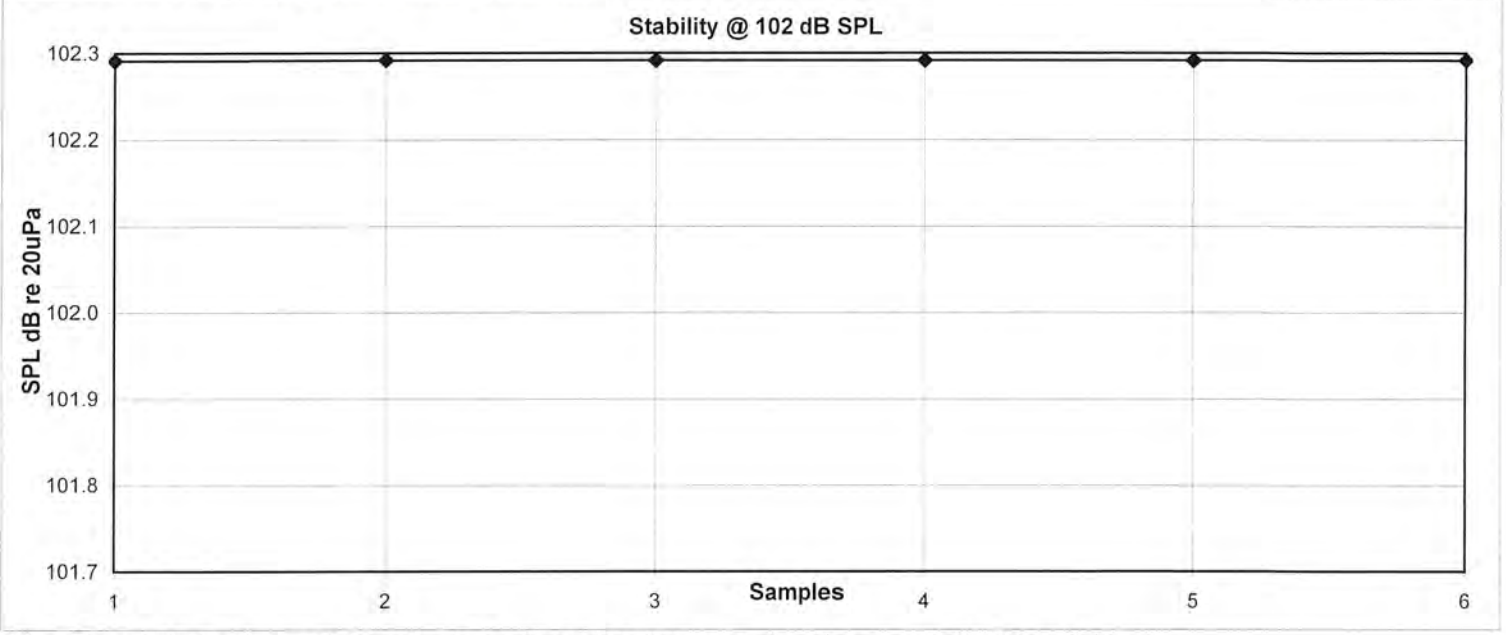
Calibration results:

Before data: ...X... **After data:** .....
Before & after data same: .....
Sound Pressure Level at 999.99 Hz and pressure of 1013 hPa (mbar)
was 102.29 dB re 20 µPa
Sound Pressure Level: **Pass**
Frequency: **Pass**
Distortion: **Pass**
Stability: **Pass**
All tested parameters: **Pass**

Laboratory Environment:		
Ambient Temperature:	20.2	°C
Ambient Humidity:	32.6	% RH
Ambient Pressure:	98.624	kPa
Calibration Date:	26-Apr-2018	
Calibration Due:	26-Apr-2019	
Report Number:	28756 -5	
Control Number:	28756	

The above listed instrument meets or exceeds the tested manufacturer's specifications.
This Calibration is traceable through NIST test numbers: 822/275722-14
The expanded uncertainty of calibration: 0.11 dB at 95% confidence level with a coverage factor of k=2.

Graph represents six samples of Sound Pressure Level measured at 5sec. interval.



The above listed instrument was checked using calibration procedure documented in West Caldwell Calibration Laboratories Inc. procedure : **Rev. 7.0 Jan. 24, 2014 Doc. # 1038 CL304METR**
Calibration was performed by West Caldwell Calibration Laboratories Inc. under Operating Procedures intended to implement the requirements of ISO10012-1, IEC Guide 25, ANSI/NCSL Z540-1, (MIL-STD-45662A) and ISO 9001:2008, ISO 17025

Cal. Date: 26-Apr-2018
Calibrated on WCCL system type 9700

Measurements performed by: .....
James Zhu

West Caldwell Calibration Laboratories Inc.
1575 State Route 96, Victor NY 14564
Tel. (585) 586-3900 FAX (585) 586-4327

Calibration Data Record

for

Metrosonics Acoustical Calibrator **Model No.: CL304** **Serial No.: 3616**
Company: Skelly & Loy, Inc.

All tested parameters: Pass

Measured Sound Pressure Level (Six samples measured at 5 sec. interval)

Sample	1	102.29 dB re 20 µPa	
	2	102.29	
	3	102.29	
	4	102.29	
	5	102.29	
	6	102.29	
	Average	**102.29**	Spec. 102 dB ± 0.3 dB

Frequency measured (Three samples at 30 sec. Interval)

Sample	1	999.96 Hz	
	2	1000.00	
	3	1000.00	
	Average	**999.99**	Spec. 1000 Hz ± 2.0%

Distortion measured -40.1 dB Spec. ≤-34 dB

Instruments used for calibration:			Date of Cal.	Traceability No.	Re-cal. Due Date
Brüel & Kjær	4231	S/N 2308998	1-Aug-2017	822/275722-14	1-Aug-2018
Brüel & Kjær	4134	S/N 854464	1-Aug-2017	822/275722-14	1-Aug-2018
Brüel & Kjær	2669	S/N 2148476	1-Aug-2017	683/281764-14	1-Aug-2018
HP	34401A	S/N US360980	1-Aug-2017	,205342	1-Aug-2018
Brüel & Kjær	2636	S/N 1323964	1-Aug-2017	822/275722-14	1-Aug-2018

Cal. Date: 26-Apr-2018 **Tested by: James Zhu**

Calibrated on WCCL system type 9700

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor NY 14564

ISO/IEC 17025: 2005
ACCREDITED
Calibration Lab. Cert. # 1533.01

REPORT OF CALIBRATION

for

Metrosonics Acoustical Calibrator **Model No.: CL304** **Serial No.: 3616**
Company: Skelly & Loy, Inc. **I. D. No.: XXXX**

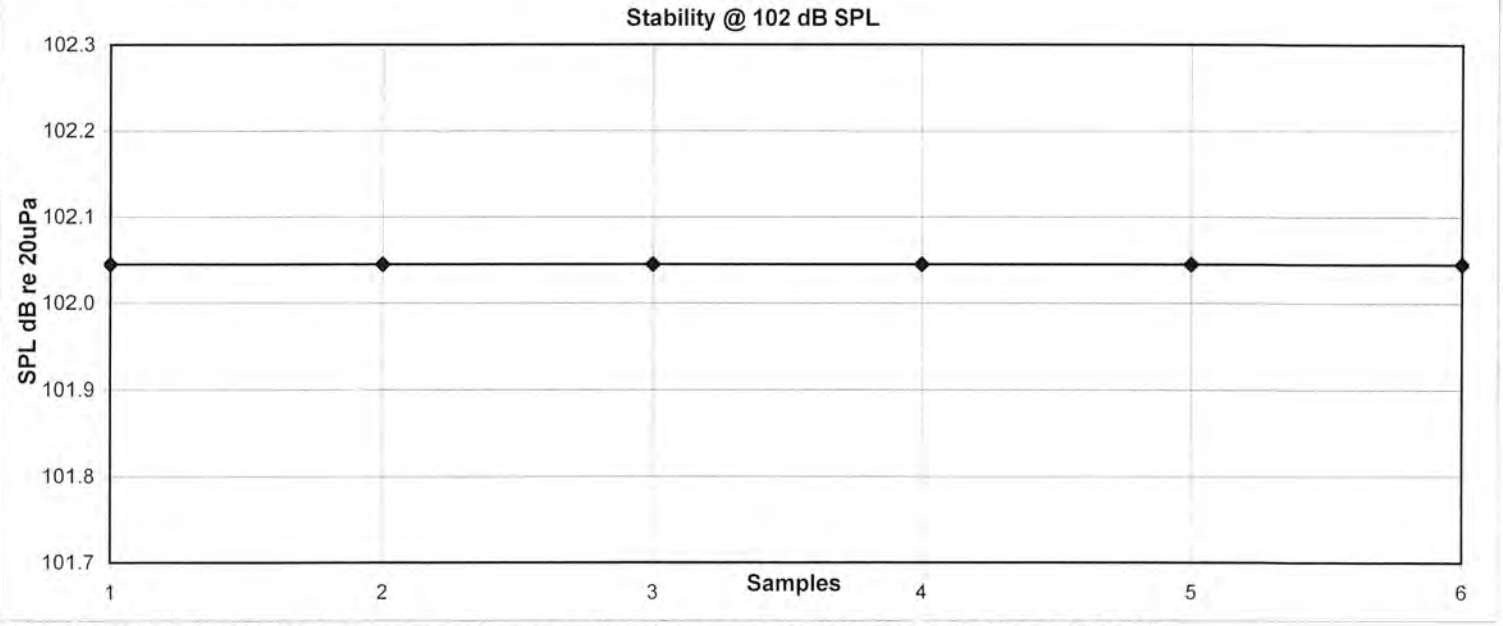
Calibration results:

Before data: ..... **After data:** ...X...
Before & after data same: .....
Sound Pressure Level at 999.99 Hz and pressure of 1013 hPa (mbar)
was 102.05 dB re 20 µPa
Sound Pressure Level: Pass
Frequency: Pass
Distortion: Pass
Stability: Pass
All tested parameters: Pass

Laboratory Environment:		
Ambient Temperature:	20.2	°C
Ambient Humidity:	32.6	% RH
Ambient Pressure:	98.624	kPa
Calibration Date:	26-Apr-2018	
Calibration Due:	26-Apr-2019	
Report Number:	28756 -5	
Control Number:	28756	

The above listed instrument meets or exceeds the tested manufacturer's specifications.
This Calibration is traceable through NIST test numbers: 822/275722-14
The expanded uncertainty of calibration: 0.11 dB at 95% confidence level with a coverage factor of k=2.

Graph represents six samples of Sound Pressure Level measured at 5sec. interval.



The above listed instrument was checked using calibration procedure documented in West Caldwell Calibration Laboratories Inc. procedure : **Rev. 7.0 Jan. 24, 2014 Doc. # 1038 CL304METR**
Calibration was performed by West Caldwell Calibration Laboratories Inc. under Operating Procedures intended to implement the requirements of ISO10012-1, IEC Guide 25, ANSI/NCSL Z540-1, (MIL-STD-45662A) and ISO 9001:2008, ISO 17025

Cal. Date: 26-Apr-2018
Calibrated on WCCL system type 9700

Measurements performed by: .....
James Zhu

Rev. 7.0 Jan. 24, 2014 Doc. # 1038CL304METR

West Caldwell Calibration Laboratories Inc.
1575 State Route 96, Victor NY 14564
Tel. (585) 586-3900 FAX (585) 586-4327

Calibration Data Record

for

Metrosonics Acoustical Calibrator **Model No.: CL304** **Serial No.: 3616**
Company: Skelly & Loy, Inc.

All tested parameters: Pass

Measured Sound Pressure Level (Six samples measured at 5 sec. interval)

Sample	1	102.05 dB re 20 µPa	
	2	102.05	
	3	102.05	
	4	102.05	
	5	102.05	
	6	102.05	
	Average	**102.05**	Spec. 102 dB ± 0.3 dB

Frequency measured (Three samples at 30 sec. Interval)

Sample	1	999.96 Hz	
	2	1000.00	
	3	1000.00	
	Average	**999.99**	Spec. 1000 Hz ± 2.0%

Distortion measured	-42.7 dB	Spec. ≤-34 dB

Instruments used for calibration:			Date of Cal.	Traceability No.	Re-cal. Due Date
Brüel & Kjær	4231	S/N 2308998	1-Aug-2017	822/275722-14	1-Aug-2018
Brüel & Kjær	4134	S/N 854464	1-Aug-2017	822/275722-14	1-Aug-2018
Brüel & Kjær	2669	S/N 2148476	1-Aug-2017	683/281764-14	1-Aug-2018
HP	34401A	S/N US360980	1-Aug-2017	,205342	1-Aug-2018
Brüel & Kjær	2636	S/N 1323964	1-Aug-2017	822/275722-14	1-Aug-2018

Cal. Date: 26-Apr-2018 **Tested by: James Zhu**

Calibrated on WCCL system type 9700

Rev. 7.0 Jan. 24, 2014 Doc. # 1038CL304METR

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

PERMISSIBLE SOUND LEVEL METER

Manufactured by:	**METROSONICS**
Model No:	**db3080**
Serial No:	**5093**
Calibration Recall No:	**28756**

Submitted By:

Customer:	**EVAN R. ZEIDERS**
Company:	**SKELLY & LOY, INC.**
Address:	**449 EISENHOWER BLVD., STE. 300**
	HARRISBURG PA 17111

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. db3080 METR

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.
The information supplied relates to the calibrated item listed above.
West Caldwell Calibration Laboratories' calibration control system meets the requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2008 and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by: FC

Calibration Date: 26-Apr-18

Felix Christopher (QA Mgr.)

Certificate No: 28756 - 4

ISO/IEC 17025:2005

ACCREDITED

Calibration Lab. Cert. # 1533.01

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

West Caldwell Calibration Laboratories Inc.
1575 State Route 96, Victor NY 14564
Tel. (585) 586-3900 FAX (585) 586-4327

Calibration Data Record

for

Manufacturer: Metrosonics

Permissible Sound Level Meter Model No.: db-3080 S/N: 5093

Submitted by, Company: Skelly & Loy, Inc.

Test	Function	Tolerance Min	Tolerance Max		Measured values Before	Out	After	Out
,0.	SPL Reading with 102.0dB SPL	101.4	102.6		102.0		102.0	
,1.	Level Accuracy	93.4	94.6	94dB	94.0		94.0	
		103.4	104.6	104dB	104.0		104.0	
		113.4	114.6	114dB	113.9		113.9	
,2.	Frequency Response	88.0	97.8	8kHz	93.2		93.2	
	A Weighting	92.1	97.9	4kHz	97.5		97.5	
		93.3	97.1	2kHz	94.8		94.8	
		92.6	95.4	1kHz	93.9		93.9	
		89.4	92.2	500Hz	90.9		90.9	
		84.0	86.8	250Hz	85.5		85.5	
		76.5	79.3	125Hz	78.3		78.3	
		65.9	69.7	63Hz	69.2		69.2	
		51.8	57.5	31.5Hz	57.2		57.2	
	C Weighting	86.1	95.9	8kHz	88.8		88.8	
		90.3	96.1	4kHz	95.8		95.8	
		91.9	95.7	2kHz	93.7		93.7	
		92.6	95.4	1kHz	94.0		94.0	
		92.6	95.4	500Hz	94.3		94.3	
		92.6	95.4	250Hz	94.4		94.4	
		92.4	95.2	125Hz	94.4		94.4	
		91.3	95.1	63Hz	93.9		93.9	
		88.2	93.9	31.5Hz	91.3		91.3	
,3								
	SLM	113.4	114.6		114.0		114.0	
	L avg. / Leq	113.4	114.6		114.0		114.0	
	L max.	113.4	114.6		114.0		114.0	
	L pk	116.1	117.9		117.7		117.7	
	Dose %							
	0.18% @ 94 dB 1kHz	0.14%	0.22%		0.19%		0.19%	
	0.73% @ 104 dB 1kHz	0.58%	0.88%		0.76%		0.76%	
	2.90% @ 114 dB 1kHz	2.32%	3.48%		3.02%		3.02%	
4	Inherent noise level				60.4		60.4	

The expanded uncertainty of calibration at 95% confidence level with a coverage factor of k=2.

Parameter	Test Instrumentation Uncertainty	DUT Uncertainty	Total DUT Uncertainty
Reading with mic. @ 1 kHz:	0.11	0.1	0.15
Meter linearity:	0.17	0.1	0.20
Attenuator accuracy:	0.17	0.1	0.20
Freq. Response: 63 Hz to 8 kHz	0.10	0.1	0.14
Inherent noise level:	0.024	0.1	0.10
Functions:	0.11	0.1	0.15
Sensitivity:	0.11	0.1	0.15
Dose:	0.30	0.1	0.32

Measurements performed by:

Calibration Date: 26-Apr-2018

James Zhu

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor NY 14564

ISO/IEC 17025: 2005
ACCREDITED
Calibration Lab. Cert. # 1533.01

REPORT OF CALIBRATION

for

Metrosonics Permissible Sound Level Meter

Model No.: db3080 **Serial No.: 51**
Company: Skelly & Loy, Inc. **I. D. No.: XXXX**

Calibration results:
Before data: ..... **After data:** .....
Before & after data same: ...X...

All tested parameters: Pass

For details see "Calibration Data Record"

Laboratory Environment:		
Ambient Temperature:	20.2	°C
Ambient Humidity:	32.6	% RH
Ambient Pressure:	98.624	kPa
Calibration Date:	26-Apr-2018	
Calibration Due:	26-Apr-2019	
Report Number:	28756 -4	
Control Number:	28756	

The above listed instrument meets or exceeds the tested manufacturer's specifications.
This Calibration is traceable through NIST test numbers listed below.
The absolute uncertainty of calibration: See last page. Unless otherwise noted, the reported values are both "as found" and "as left" data.

The above listed instrument was checked using calibration procedure documented in West Caldwell Calibration Laboratories Inc. procedure : **Rev. 7.0 Jan. 24, 2014 Doc. # 1038 DB3080METR**
Calibration was performed by West Caldwell Calibration Laboratories Inc. under Operating Procedures intended to implement the requirements of ISO10012-1, IEC Guide 25, ANSI/NCSL Z540-1, (MIL-STD-45662A) and ISO 9001:2008, ISO 17025

NIST Traceable Instruments:			Date of Cal.	Traceability No.	Re-cal. Due Date
Brüel & Kjær	4226	S/N 2272364	1-Aug-2017	822/275722-15	1-Aug-2018

Cal. Date: 26-Apr-2018
Measurements performed by: .....
James Zhu

Calibrated on WCCL system type 9700

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

PERMISSIBLE SOUND LEVEL METER

Manufactured by:	**METROSONICS**
Model No:	**db3080**
Serial No:	**4618**
Calibration Recall No:	**28756**

Submitted By:

Customer:	**EVAN R. ZEIDERS**
Company:	**SKELLY & LOY, INC.**
Address:	**449 EISENHOWER BLVD., STE. 300**
	HARRISBURG PA 17111

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. db3080 METR

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.
The information supplied relates to the calibrated item listed above.
West Caldwell Calibration Laboratories' calibration control system meets the requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2008 and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by: FC

Calibration Date: 26-Apr-18

Felix Christopher (QA Mgr.)

Certificate No: 28756 - 3

ISO/IEC 17025:2005

ACCREDITED

Calibration Lab. Cert. # 1533.01

uncompromised calibration West Caldwell Calibration Laboratories, Inc.
1575 State Route 96, Victor, NY 14564, U.S.A.

West Caldwell Calibration Laboratories Inc.
1575 State Route 96, Victor NY 14564
Tel. (585) 586-3900 FAX (585) 586-4327

Calibration Data Record

for

Manufacturer: Metrosonics

Permissible Sound Level Meter Model No.: db-3080 S/N: 4618

Submitted by, Company: Skelly & Loy, Inc.

Test	Function	Tolerance Min	Tolerance Max		Measured values Before	Out	After	Out
,0.	SPL Reading with 102.0dB SPL	101.4	102.6		102.1		102.1	
,1.	Level Accuracy	93.4	94.6	94dB	94.1		94.1	
		103.4	104.6	104dB	104.3		104.3	
		113.4	114.6	114dB	114.1		114.1	
,2.	Frequency Response	88.0	97.8	8kHz	92.5		92.5	
	A Weighting	92.1	97.9	4kHz	96.8		96.8	
		93.3	97.1	2kHz	94.5		94.5	
		92.6	95.4	1kHz	94.1		94.1	
		89.4	92.2	500Hz	91.4		91.4	
		84.0	86.8	250Hz	86.2		86.2	
		76.5	79.3	125Hz	78.9		78.9	
		65.9	69.7	63Hz	69.1		69.1	
		51.8	57.5	31.5Hz	56.1		56.1	
	C Weighting	86.1	95.9	8kHz	90.6		90.6	
		90.3	96.1	4kHz	95.0		95.0	
		91.9	95.7	2kHz	93.1		93.1	
		92.6	95.4	1kHz	94.1		94.1	
		92.6	95.4	500Hz	94.7		94.7	
		92.6	95.4	250Hz	94.7		94.7	
		92.4	95.2	125Hz	94.7		94.7	
		91.3	95.1	63Hz	93.9		93.9	
		88.2	93.9	31.5Hz	91.5		91.5	
,3								
	SLM	113.4	114.6		113.9		113.9	
	L avg. / Leq	113.4	114.6		113.9		113.9	
	L max.	113.4	114.6		114.1		114.1	
	L pk	116.1	117.9		117.8		117.8	
	Dose %							
	0.18% @ 94 dB 1kHz	0.14%	0.22%		0.18%		0.18%	
	0.73% @ 104 dB 1kHz	0.58%	0.88%		0.78%		0.78%	
	2.90% @ 114 dB 1kHz	2.32%	3.48%		2.95%		2.95%	
4	Inherent noise level				60.1		60.1	

The expanded uncertainty of calibration at 95% confidence level with a coverage factor of k=2.

Parameter	Test Instrumentation Uncertainty	DUT Uncertainty	Total DUT Uncertainty
Reading with mic. @ 1 kHz:	0.11	0.1	0.15
Meter linearity:	0.17	0.1	0.20
Attenuator accuracy:	0.17	0.1	0.20
Freq. Response: 63 Hz to 8 kHz	0.10	0.1	0.14
Inherent noise level:	0.024	0.1	0.10
Functions:	0.11	0.1	0.15
Sensitivity:	0.11	0.1	0.15
Dose:	0.30	0.1	0.32

Measurements performed by:

Calibration Date: 26-Apr-2018

James Zhu

uncompromised calibration
West Caldwell Calibration Laboratories, Inc.
1575 State Route 96, Victor NY 14564

ISO/IEC 17025: 2005
ACCREDITED
Calibration Lab. Cert. # 1533.01

REPORT OF CALIBRATION

for

Metrosonics Permissible Sound Level Meter

Model No.: db3080 **Serial No.: 4618**
Company: Skelly & Loy, Inc. **I. D. No.: XXXX**

Calibration results:
Before data: ..... **After data:** .....
Before & after data same: ...X...

All tested parameters: Pass

For details see "Calibration Data Record"

Laboratory Environment:		
Ambient Temperature:	**20.2**	°C
Ambient Humidity:	**32.6**	% RH
Ambient Pressure:	**98.624**	kPa
Calibration Date:	**26-Apr-2018**	
Calibration Due:	**26-Apr-2019**	
Report Number:	**28756 -3**	
Control Number:	**28756**	

The above listed instrument meets or exceeds the tested manufacturer's specifications.
This Calibration is traceable through NIST test numbers listed below.
The absolute uncertainty of calibration: See last page. Unless otherwise noted, the reported values are both "as found" and "as left" data.

The above listed instrument was checked using calibration procedure documented in West Caldwell Calibration Laboratories Inc. procedure : **Rev. 7.0 Jan. 24, 2014 Doc. # 1038 DB3080METR**
Calibration was performed by West Caldwell Calibration Laboratories Inc. under Operating Procedures intended to implement the requirements of ISO10012-1, IEC Guide 25, ANSI/NCSL Z540-1, (MIL-STD-45662A) and ISO 9001:2008, ISO 17025

NIST Traceable Instruments:			Date of Cal.	Traceability No.	Re-cal. Due Date
Brüel & Kjær	4226	S/N 2272364	1-Aug-2017	822/275722-15	1-Aug-2018

Cal. Date: 26-Apr-2018
Measurements performed by: .....
James Zhu

Calibrated on WCCL system type 9700

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

PERMISSIBLE SOUND LEVEL METER

Manufactured by:	**METROSONICS**
Model No:	**db3080**
Serial No:	**3897**
Calibration Recall No:	**28756**

Submitted By:

Customer:	**EVAN R. ZEIDERS**
Company:	**SKELLY & LOY, INC.**
Address:	**449 EISENHOWER BLVD., STE. 300**
	HARRISBURG PA 17111

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. db3080 METR

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.
The information supplied relates to the calibrated item listed above.
West Caldwell Calibration Laboratories' calibration control system meets the requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2008 and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by: FC

Felix Christopher (QA Mgr.)

Calibration Date: 26-Apr-18

Certificate No: 28756 - 2

ISO/IEC 17025:2005

ACCREDITED

Calibration Lab. Cert. # 1533.01

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

West Caldwell Calibration Laboratories Inc.
1575 State Route 96, Victor NY 14564
Tel. (585) 586-3900 FAX (585) 586-4327

Calibration Data Record

for
Manufacturer: Metrosonics

Permissible Sound Level Meter Model No.: db-3080 S/N: 3897
Submitted by, Company: Skelly & Loy, Inc.

Test	Function	Tolerance Min	Tolerance Max		Measured values Before	Out	After	Out
,0.	SPL Reading with 102.0dB SPL	101.4	102.6		102.0		102.0	
,1.	Level Accuracy	93.4	94.6	94dB	94.1		94.1	
		103.4	104.6	104dB	104.0		104.0	
		113.4	114.6	114dB	114.1		114.1	
,2.	Frequency Response	88.0	97.8	8kHz	94.0		94.0	
	A Weighting	92.1	97.9	4kHz	97.8		97.8	
		93.3	97.1	2kHz	95.6		95.6	
		92.6	95.4	1kHz	94.2		94.2	
		89.4	92.2	500Hz	91.2		91.2	
		84.0	86.8	250Hz	85.6		85.6	
		76.5	79.3	125Hz	77.7		77.7	
		65.9	69.7	63Hz	68.0		68.0	
		51.8	57.5	31.5Hz	55.5		55.5	
	C Weighting	86.1	95.9	8kHz	92.0		92.0	
		90.3	96.1	4kHz	92.8		92.8	
		91.9	95.7	2kHz	94.0		94.0	
		92.6	95.4	1kHz	94.0		94.0	
		92.6	95.4	500Hz	94.1		94.1	
		92.6	95.4	250Hz	94.3		94.3	
		92.4	95.2	125Hz	94.0		94.0	
		91.3	95.1	63Hz	93.2		93.2	
		88.2	93.9	31.5Hz	90.4		90.4	
,3								
	SLM	113.4	114.6		114.0		114.0	
	L avg. / Leq	113.4	114.6		114.0		114.0	
	L max.	113.4	114.6		114.0		114.0	
	L pk	116.1	117.9		116.6		116.6	
	Dose %							
	0.18% @ 94 dB 1kHz	0.14%	0.22%		0.19%		0.19%	
	0.73% @ 104 dB 1kHz	0.58%	0.88%		0.81%		0.81%	
	2.90% @ 114 dB 1kHz	2.32%	3.48%		3.14%		3.14%	
4	Inherent noise level				59.4		59.4	

The expanded uncertainty of calibration at 95% confidence level with a coverage factor of k=2.

Parameter	Test Instrumentation Uncertainty	DUT Uncertainty	Total DUT Uncertainty
Reading with mic. @ 1 kHz:	0.11	0.1	0.15
Meter linearity:	0.17	0.1	0.20
Attenuator accuracy:	0.17	0.1	0.20
Freq. Response: 63 Hz to 8 kHz	0.10	0.1	0.14
Inherent noise level:	0.024	0.1	0.10
Functions:	0.11	0.1	0.15
Sensitivity:	0.11	0.1	0.15
Dose:	0.30	0.1	0.32

Measurements performed by:

Calibration Date: 26-Apr-2018

James Zhu

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor NY 14564

ISO/IEC 17025: 2005
ACCREDITED
Calibration Lab. Cert. # 1533.01

REPORT OF CALIBRATION

for

Metrosonics Permissible Sound Level Meter

Model No.: db3080 **Serial No.: 3897**
Company: Skelly & Loy, Inc. **I. D. No.: XXXX**

Calibration results:
Before data: ..... **After data:** .....
Before & after data same: ...X...

All tested parameters: Pass

For details see "Calibration Data Record"

Laboratory Environment:		
Ambient Temperature:	20.2	°C
Ambient Humidity:	32.6	% RH
Ambient Pressure:	98.624	kPa
Calibration Date:	26-Apr-2018	
Calibration Due:	26-Apr-2019	
Report Number:	28756 -2	
Control Number:	28756	

The above listed instrument meets or exceeds the tested manufacturer's specifications.
This Calibration is traceable through NIST test numbers listed below.
The absolute uncertainty of calibration: See last page. Unless otherwise noted, the reported values are both "as found" and "as left" data.

The above listed instrument was checked using calibration procedure documented in West Caldwell Calibration Laboratories Inc. procedure : **Rev. 7.0 Jan. 24, 2014 Doc. # 1038 DB3080METR**
Calibration was performed by West Caldwell Calibration Laboratories Inc. under Operating Procedures intended to implement the requirements of ISO10012-1, IEC Guide 25, ANSI/NCSL Z540-1, (MIL-STD-45662A) and ISO 9001:2008, ISO 17025

NIST Traceable Instruments:			Date of Cal.	Traceability No.	Re-cal. Due Date
Brüel & Kjær	4226	S/N 2272364	1-Aug-2017	822/275722-15	1-Aug-2018

Cal. Date: 26-Apr-2018
Calibrated on WCCL system type 9700

Measurements performed by: .....
James Zhu

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

PERMISSIBLE SOUND LEVEL METER

Manufactured by:	**METROSONICS**
Model No:	**db3080**
Serial No:	**3895**
Calibration Recall No:	**28756**

Submitted By:

Customer:	**EVAN R. ZEIDERS**
Company:	**SKELLY & LOY, INC.**
Address:	**449 EISENHOWER BLVD., STE. 300**
	HARRISBURG PA 17111

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. db3080 METR

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.
The information supplied relates to the calibrated item listed above.
West Caldwell Calibration Laboratories' calibration control system meets the requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2008 and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by: FC

Calibration Date: 26-Apr-18

Felix Christopher (QA Mgr.)

Certificate No: 28756 - 1

ISO/IEC 17025:2005

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

ACCREDITED
Calibration Lab. Cert. # 1533.01

West Caldwell Calibration Laboratories Inc.

1575 State Route 96, Victor NY 14564
Tel. (585) 586-3900 FAX (585) 586-4327

Calibration Data Record

for

Manufacturer: Metrosonics

Permissible Sound Level Meter Model No.: db-3080 S/N: 3895

Submitted by, Company: Skelly & Loy, Inc.

Test	Function	Tolerance Min	Tolerance Max		Measured values Before	Out	After	Out
,0.	SPL Reading with 102.0dB SPL	101.4	102.6		102.0		102.0	
,1.	Level Accuracy	93.4	94.6	94dB	94.0		94.0	
		103.4	104.6	104dB	104.0		104.0	
		113.4	114.6	114dB	114.0		114.0	
,2.	Frequency Response	88.0	97.8	8kHz	93.6		93.6	
	A Weighting	92.1	97.9	4kHz	94.9		94.9	
		93.3	97.1	2kHz	95.6		95.6	
		92.6	95.4	1kHz	94.0		94.0	
		89.4	92.2	500Hz	91.4		91.4	
		84.0	86.8	250Hz	85.3		85.3	
		76.5	79.3	125Hz	77.6		77.6	
		65.9	69.7	63Hz	67.6		67.6	
		51.8	57.5	31.5Hz	54.0		54.0	
	C Weighting	86.1	95.9	8kHz	92.0		92.0	
		90.3	96.1	4kHz	93.2		93.2	
		91.9	95.7	2kHz	94.4		94.4	
		92.6	95.4	1kHz	94.0		94.0	
		92.6	95.4	500Hz	94.0		94.0	
		92.6	95.4	250Hz	94.0		94.0	
		92.4	95.2	125Hz	94.0		94.0	
		91.3	95.1	63Hz	93.1		93.1	
		88.2	93.9	31.5Hz	89.6		89.6	
,3								
	SLM	113.4	114.6		114.0		114.0	
	L avg. / Leq	113.4	114.6		114.0		114.0	
	L max.	113.4	114.6		114.2		114.2	
	L pk	116.1	117.9		116.8		116.8	
	Dose %							
	0.18% @ 94 dB 1kHz	0.14%	0.22%		0.17%		0.17%	
	0.73% @ 104 dB 1kHz	0.58%	0.88%		0.78%		0.78%	
	2.90% @ 114 dB 1kHz	2.32%	3.48%		2.93%		2.93%	
4	Inherent noise level				62.4		62.4	

The expanded uncertainty of calibration at 95% confidence level with a coverage factor of k=2.

Parameter	Test Instrumentation Uncertainty	DUT Uncertainty	Total DUT Uncertainty
Reading with mic. @ 1 kHz:	0.11	0.1	0.15
Meter linearity:	0.17	0.1	0.20
Attenuator accuracy:	0.17	0.1	0.20
Freq. Response: 63 Hz to 8 kHz	0.10	0.1	0.14
Inherent noise level:	0.024	0.1	0.10
Functions:	0.11	0.1	0.15
Sensitivity:	0.11	0.1	0.15
Dose:	0.30	0.1	0.32

Measurements performed by:

Calibration Date: 26-Apr-2018

James Zhu

uncompromised calibration **West Caldwell Calibration Laboratories, Inc.**

1575 State Route 96, Victor NY 14564

ISO/IEC 17025: 2005

ACCREDITED

Calibration Lab. Cert. # 1533.01

REPORT OF CALIBRATION

for

Metrosonics Permissible Sound Level Meter

Model No.: db3080 **Serial No.: 3895**

Company: Skelly & Loy, Inc. **I. D. No.: XXXX**

Calibration results:

Before data: ..... **After data:** .....

Before & after data same: ...X...

All tested parameters: Pass

For details see "Calibration Data Record"

Laboratory Environment:		
Ambient Temperature:	**20.2**	°C
Ambient Humidity:	**32.6**	% RH
Ambient Pressure:	**98.624**	kPa
Calibration Date:	**26-Apr-2018**	
Calibration Due:	**26-Apr-2019**	
Report Number:	**28756 -1**	
Control Number:	**28756**	

The above listed instrument meets or exceeds the tested manufacturer's specifications.

This Calibration is traceable through NIST test numbers listed below.

The absolute uncertainty of calibration: See last page. Unless otherwise noted, the reported values are both "as found" and "as left" data.

The above listed instrument was checked using calibration procedure documented in West Caldwell Calibration Laboratories Inc. procedure : **Rev. 7.0 Jan. 24, 2014 Doc. # 1038 DB3080METR**

Calibration was performed by West Caldwell Calibration Laboratories Inc. under Operating Procedures intended to implement the requirements of ISO10012-1, IEC Guide 25, ANSI/NCSL Z540-1, (MIL-STD-45662A) and ISO 9001:2008, ISO 17025

NIST Traceable Instruments:			Date of Cal.	Traceability No.	Re-cal. Due Date
Brüel & Kjær	4226	S/N 2272364	1-Aug-2017	822/275722-15	1-Aug-2018

Cal. Date: 26-Apr-2018

Measurements performed by: .....

James Zhu

Calibrated on WCCL system type 9700

APPENDIX D -
TRAFFIC DATA

I-83 North York Widening
2014 Existing Traffic Volumes

	Roadway	Existing		Truck %		Posted Speed limit (mph)	Volume Source	Truck % source
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour			
I-83 NB	I-83 NB, south of Ramp R	2,975	3,080	16%	16%	55	Appendix E of the Traffic Report (August 2014) - See "balanced/modified volumes"	TMS Site 48521
	Ramp R	785	925	7%	7%	30		TMS Site 37779
	Ramp Q	155	155	7%	7%	20		TMS Site 37780
	Ramp P	295	530	7%	7%	25		TMS Site 37785
	I-83 NB, between Ramp P and Ramp X	2,640	2,840	15%	15%	55		TMS Site 4759
	Ramp X	145	180	7%	7%	25		TMS Site 37786
	Ramp V	630	670	7%	7%	25		TMS Site 37790
	Ramp W	375	395	7%	7%	25		TMS Site 37791
	I-83 NB, Exit 21 to Exit 22	2,240	2,385	15%	15%	55		TMS Site 4759
	Ramp A	345	550	7%	7%	30		TMS Site 37792
	Ramp B	405	460	7%	7%	20		TMS Site 37793
	I-83 NB, north of Ramp B	2,300	2,295	15%	15%	65		TMS Site 4760
I-83 SB	I-83 SB, north of Ramp C	2,405	2,690	15%	15%	65	Appendix E of the Traffic Report (August 2014) - See "balanced/modified volumes"	
	Ramp C	570	625	7%	7%	40		TMS Site 37795
	Ramp D	380	305	7%	7%	40		TMS Site 37794
	I-83 SB, Exit 22 to Exit 21	2,215	2,370	15%	15%	55		TMS Site 4759
	Ramp U	130	145	7%	7%	25		TMS Site 37789
	Ramp Y	360	300	7%	7%	25		TMS Site 37788
	Ramp Z	765	750	7%	7%	25		TMS Site 37787
	I-83 SB, between Ramp Z and Ramp N	2,750	2,965	15%	15%	55		TMS Site 4759
	Ramp N	215	170	7%	7%	25		TMS Site 37784
	Ramp M	555	655	7%	7%	20		TMS Site 37783
	Ramp S	725	330	7%	7%	20		TMS Site 37782
	Ramp T	200	305	7%	7%	20		TMS Site 37781
	I-83 SB, south of Ramp T	2,565	3,425	16%	16%	55		TMS Site 48521
SR 0462 (E Market St)	SR 0462 EB, west of Belmont St intersection	675	1,145	4%	4%	35	Appendix H of the Traffic Report (August 2014) - See Synchro results	TMS Site 13897 & TMS Site 26702
	SR 0462 EB, between Belmont St intersection and North Hills Rd intersection	1,130	1,600	4%	4%	35		
	SR 0462 EB, east of North Hills Rd intersection	970	1,500	4%	4%	35		
	SR 0462 WB, east of North Hills Rd intersection	932	1,255	4%	4%	35		
	SR 0462 WB, between Belmont St intersection and North Hills Rd intersection	1,060	1,885	4%	4%	35		
	SR 0462 WB, west of Belmont St intersection	720	995	4%	4%	35		
North Hills Road	North Hills Rd NB, between SR 0462 intersection and Ramp P	890	1,130	11%	11%	35	Appendix H of the Traffic Report (August 2014) - See Synchro results AND AM/PM Base Synchro Files	TMS Site 4834
	North Hills Rd NB, between Ramp P and Industrial Hwy intersection	700	750	11%	11%	35		
	North Hills Rd NB, between Industrial Hwy intersection and US 30 intersection	615	720	11%	11%	35		
	North Hills Rd SB, between US 30 intersection and Industrial Hwy intersection	750	755	11%	11%	35		
	North Hills Rd SB, between Industrial Hwy intersection and Ramp P	760	1,085	11%	11%	35		
	North Hills Rd SB, between Ramp P and SR 0462 intersection	655	945	11%	11%	35		
Belmont St	N Belmont St NB north of SR 0462 intersection	39	13	3%	3%	25	TMC 11	TMS Site 21101
	N Belmont St SB north of SR 0462 intersection	98	147	3%	3%	25	TMC 11	
	S Belmont St SB from SR 0462 intersection to Ramp S/T	398	344	3%	3%	35	TMC 11	
	S Belmont St SB south of Ramp S/T	336	47	3%	3%	35	N:\31926-001\Engineering\Design\Traffic\Analysis\VISSIM\Phase 1\04_Node Summary REVISED	
	S Belmont St NB south of Ramp S/T	187	142	3%	3%	35	N:\31926-001\Engineering\Design\Traffic\Analysis\VISSIM\Phase 1\04_Node Summary REVISED	
	S Belmont St NB from Ramp S/T to SR 0462 intersection	420	413	3%	3%	35	TMC 11	
US 30	US 30 EB, between George St and Ramp Z	2,315	2,340	9%	9%	40	Appendix E of the Traffic Report (August 2014) - See "balanced/modified volumes"	TMS Site 26574
	US 30 EB, between Ramp Y and Toronita St	2,055	2,070	12%	12%	40		TMS Site 4735
	US 30 EB, east of Toronita St	1,980	1,920	12%	12%	40		TMS Site 4735
	US 30 WB, east of Toronita St	1,745	1,965	10%	10%	40		TMS Site 4735
	US 30 WB, between Toronita St and Ramp W	1,820	2,100	10%	10%	40		TMS Site 4735
	US 30 WB, between Ramp W and Ramp U	1,945	2,230	10%	10%	40		TMS Site 4735
	US 30 WB, between Ramp U and George St	1,945	2,230	9%	9%	40		TMS Site 26574
Toronita St	Toronita St NB, north of US 30	255	235	22%	22%	35	Appendix E of the Traffic Report (August 2014) - See "balanced/modified volumes"	TMS Site 50536
	Toronita St NB, south of US 30	150	175	7%	7%	35		Match other ramps at interchange
	Toronita St SB, north of US 30	275	250	22%	22%	35		TMS Site 50536
	Toronita St SB, south of US 30	170	205	7%	7%	35		Match other ramps at interchange
North George St	N George St NB, between US 30 and Lightner Rd/Ramps C/D interchange	904	1,016	9%	9%	40	Appendix B: George St (SR 181) between Lightner Rd & US 30 (ATR #2)	TMS Site 12763
	N George St NB, between Lightner Rd/Ramps C/D interchange and Ramps A/B	755	980	9%	9%	40	Synchro Base	
	N George St NB, north of Ramps A/B	625	815	9%	9%	40	Synchro Base	
	N George St SB, north of Ramps A/B	695	875	9%	9%	40	Synchro Base	
	N George St SB, between Ramps A/B and Lightner Rd/Ramps C/D interchange	765	1,130	9%	9%	40	Synchro Base	
	N George St SB, between Lightner Rd/Ramps C/D interchange and US 30	1,014	1,107	9%	9%	40	Appendix B: George St (SR 181) between Lightner Rd & US 30 (ATR #2)	

I-83 North York Widening
2014 Existing Traffic Turning Movements

Existing Turning Movement Count Data Summary														
Intersection	Peak Hour	EB			WB			NB			SB			
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
01. SR 0462/Ramp R/North Hills Rd	AM	275	700	155	0	870	190	100	425	260	10	0	645	
Source: Appendix H of TTR (Aug 2014) - Synchro Results	PM	344	1199	154	0	984	247	49	463	379	22	0	841	
02. SR 0462/Belmont St	AM	5	615	55	325	705	30	10	10	435	80	20	5	
Source: Appendix H of TTR (Aug 2014) - Synchro Results	PM	5	1070	70	250	970	10	20	5	400	130	25	5	
03. North Hills Rd/Ramp P	AM	-	-	-	10	5	35	180	585	60	5	605	110	
Source: Appendix H of TTR (Aug 2014) - Synchro Results	PM	-	-	-	65	15	10	300	720	110	10	880	195	
04. North Hills Rd/Industrial Hwy	AM	35	20	5	165	35	100	35	480	185	80	590	60	
Source: Appendix H of TTR (Aug 2014) - Synchro Results	PM	45	15	5	430	55	120	40	535	175	125	580	45	
05. US 30/Toronita St	AM	125	1805	125	35	1620	90	45	40	65	110	10	155	
Source: Appendix E or Appendix H of TTR (August 2014)	PM	145	1785	140	50	1840	75	90	20	65	70	10	170	
06. North George St/ Lightner Rd/Ramp C/Ramp D	AM	200	235	25	-	-	-	5	525	5	140	370	255	
Source: Appendix H of TTR (Aug 2014) - Synchro Results	PM	275	150	10	-	-	-	5	640	5	150	400	580	
07. North George St/ Masonic Dr	AM	2	1	9	136	0	15	6	438	45	11	439	3	
Source: TMC 20 (Oct 2017)	PM	2	0	8	107	1	9	16	726	75	12	618	4	

SR 181 at Lightner Road/SB I-83 Ramps Cheat Sheet

	From	To
EBL	Lightner Rd	NB SR 181
EBT	Lightner Rd	SB I-83 ON
EBR	Lightner Rd	SB SR 181
NBL	NB SR 181	Lightner Rd
NBT	NB SR 181	NB SR 181
NBR	NB SR 181	SB I-83 On-Ramp
SBL	SB SR 181	SB I-83 On-Ramp
SBT	SB SR 181	SB SR 181
SBR	SB SR 181	Lightner Rd

SB I-83 Exit Ramp to Lightner Rd/George St		
SBL (to NB 181)	SBT (to SB 181)	SBR (to Lightner Rd)
30	350	190
65	380	230

I-83 North York Widening
2042 Design Year Traffic Volumes

	Roadway	2042 Design Year		Truck %		Design Speed limit	Posted Speed limit
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	(mph)	(mph)
I-83 NB	I-83 NB, south of Ramp R	3,350	3,555	16%	16%	60 to 70	55
	SR 8013 Ramp R	900	1,030	7%	7%	35	35
	SR 8013 Ramp Q	270	305	7%	7%	20	20
	I-83 NB, between Ramp Q and Ramp V	2,715	2,835	15%	15%	60 to 70	55
	SR 8013 Ramp V	610	805	7%	7%	35 to 40	35
	I-83 NB, between Ramp V and Ramp X	3,270	3,540	15%	15%	60 to 70	55
	SR 8015 Ramp X	210	175	7%	7%	30	30
	SR 8015 Ramp V	835	1,105	7%	7%	25	25
	SR 8015 Ramp W	290	300	7%	7%	35	35
	SR 8017 Ramp A	425	590	7%	7%	40	40
	SR 8017 Ramp E	430	565	7%	7%	50	50
	I-83 NB, north of Ramp E	2,565	2,600	15%	15%	60 to 70	65
I-83 SB	I-83 SB, north of Ramp C	2,875	3,200	15%	15%	60 to 70	65
	SR 8017 Ramp C	775	765	7%	7%	30	30
	SR 8017 Ramp D	870	935	7%	7%	40	40
	SR 8015 Ramp Y	475	555	7%	7%	25	25
	SR 8015 Ramp Z	705	745	7%	7%	25	25
	I-83 SB, between Ramp Z and Ramp N	3,195	3,555	15%	15%	60 to 70	55
	SR 8013 Ramp N	200	165	7%	7%	35	35
	SR 8013 Ramp U	970	500	7%	7%	35	35
	I-83 SB, between Ramp N and Ramp M	2,025	2,880	7%	7%	60 to 70	55
	SR 8013 Ramp M	500	905	7%	7%	25	25
	SR 8013 Ramp T	195	35	7%	7%	35	35
	I-83 SB, south of Ramp T	2,715	3,825	16%	16%	60 to 70	55
SR 0462 (E Market St)	SR 0462 EB, west of Belmont St intersection	880	1,435	4%	4%		35
	SR 0462 EB, between Belmont St intersection and North Hills Rd intersection	1,430	2,030	4%	4%		35
	SR 0462 EB, east of North Hills Rd intersection	1,240	1,765	4%	4%		35
	SR 0462 WB, east of North Hills Rd intersection	1,365	1,600	4%	4%		35
	SR 0462 WB, between Belmont St intersection and North Hills Rd intersection	1,865	2,160	4%	4%		35
	SR 0462 WB, west of Belmont St intersection	1,080	1,340	4%	4%		35
North Hills Road	North Hills Rd NB, between SR 0462 intersection and Industrial Hwy intersection	945	1,305	11%	11%		35
	North Hills Rd NB, between Industrial Hwy intersection and US 30 intersection	620	830	11%	11%		35
	North Hills Rd SB, between US 30 intersection and Ramp V intersection	940	930	11%	11%		35
	North Hills Rd SB, between Industrial Hwy intersection and SR 0462 intersection	630	890	11%	11%		35
Belmont St	S Belmont St SB from SR 0462 intersection to Ramp T	510	130	3%	3%		35
	S Belmont St SB south of Ramp T	420	60	3%	3%		35
	S Belmont St NB south of Ramp T	225	175	3%	3%		35
	S Belmont St NB from Ramp T to SR 0462 intersection	115	165	3%	3%		35
US 30	US 30 EB, between George St and Ramp Z	2,475	2,620	9%	9%		40
	US 30 EB, between Ramp Y and Toronita St	2,170	2,340	12%	12%		40
	US 30 EB, east of Toronita St	2,320	2,315	12%	12%		40
	US 30 WB, east of Toronita St	1,520	1,520	10%	10%		40
	US 30 WB, between Toronita St and Ramp W	1,595	1,765	10%	10%		40
	US 30 WB, between Ramp V and George St	2,140	2,570	10%	10%		40
Toronita St	Toronita St NB, north of US 30	360	300	22%	22%		35
	Toronita St SB, north of US 30	390	340	7%	7%		35
	Toronita St SB, south of US 30	205	230	7%	7%		35
North George St	N George St NB, between US 30 and Ramp C/D roundabout	795	1,100	9%	9%		40
	N George St NB, between Ramp C/D roundabout and Lightner Rd roundabout	765	1,035	9%	9%		40
	N George St NB, between Lightner Rd roundabout and Ramp A roundabout	915	1,205	9%	9%		40
	N George St NB, between Ramp A roundabout and Masonic Dr	1,175	1,560	9%	9%		40
	N George St NB, between Masonic Dr and Ramp E	1,035	1,135	9%	9%		40
	N George St NB, north of Ramp E	650	580	9%	9%		40
	N George St SB, north of Ramp E	720	900	9%	9%		40
	N George St SB, between Ramp E and Masonic Dr	750	895	9%	9%		40
	N George St SB, between Masonic Dr and Ramp A roundabout	835	1,085	9%	9%		40
	N George St SB, between Ramp A roundabout and Lightner Rd roundabout	1,000	1,350	9%	9%		40
	N George St SB, between Lightner Rd roundabout and Ramp C/D roundabout	900	930	9%	9%		40
	N George St SB, between Ramp C/D roundabout and US 30	970	925	9%	9%		40

Assumptions:

1 Truck Percentages Unchanged from Existing to Future
2 Ramp Design Speeds per L&G Report, Appendix E
3 I-83 Ramp PSL = Design Speed
4 I-83 PSL to remain same as existing

I-83 North York Widening
2042 Design Year Traffic Turning Movements

2042 Design Year Turning Movement Count Data Summary													
Intersection		**EB**			**WB**			**NB**			**SB**		
	Peak Hour	**Left**	**Thru**	**Right**	**Left**	**Thru**	**Right**	**Left**	**Thru**	**Right**	**Left**	**Thru**	**Right**
01. SR 0462/Ramp R/North Hills Rd	AM	269	875	270	0	1115	249	132	428	347	15	0	619
	PM	342	1371	305	0	1253	346	40	617	375	19	0	867
02. SR 0462/Ramp U/S Belmont St	AM	0	835	46	402	967	0	1	0	111	484	465	110
	PM	0	1426	9	42	1214	0	1	0	164	438	79	125
03. S Belmont St/Ramp T	AM	25	25	25	0	0	0	0	111	111	83	421	413
(Elmwood Blvd On-Ramp)	PM	25	25	25	0	0	0	0	162	11	23	54	52
04. North Hills Rd/Industrial Hwy	AM	0	0	0	46	147	96	211	520	209	73	580	247
Includes Ramp V volumes	PM	0	0	0	294	176	118	335	639	230	136	510	292
05. North Hills Rd/Ramp V	AM	*See 04. North Hills Rd/Industrial Hwy*											
	PM												
06. US 30/Toronita St	AM	118	1934	114	71	1350	93	56	148	200	185	15	189
	PM	102	2075	163	54	1410	53	131	145	138	102	13	223
07. North George St/ Masonic Dr	AM	3	2	11	131	0	69	14	1054	108	17	682	5
	PM	3	0	10	195	0	27	30	1368	141	17	871	6
08. North George St/Ramp E/Skyview Dr	AM	0	0	0	25	5	10	412	605	16	5	697	16
	PM	0	0	0	11	5	9	560	532	28	16	878	4

I-83 North York Widening 2014 PM Peak Traffic

I-83 NB, south of Ramp R

Total Vehicles	Truck %						individual lane (per 2 lanes)		MPH
			Cars	2587			Cars	1294	55
3,080	16		MT	164			MT	82	55
			HT	329			HT	164	55

I-83 NB,between Ramp R and Ramp Q

Total Vehicles	Truck %						individual lane (per 2 lanes)		MPH
			Cars	1810			Cars	905	55
2,155	16		MT	115			MT	57	55
			HT	230			HT	115	55

I-83 NB,between Ramp Q and Ramp P

Total Vehicles	Truck %						individual lane (per 2 lanes)		MPH
			Cars	1940			Cars	970	55
2,310	16		MT	123			MT	62	55
			HT	246			HT	123	55

Ramp R

Total Vehicles	Truck %								
			Cars	860					
925	7		MT	22					
			HT	43					

Ramp R Left Turn

Total Vehicles	Truck %								
			Cars	46					
49	7		MT	1					
			HT	2					

Ramp R Thru

Total Vehicles	Truck %								
			Cars	431					
463	7		MT	11					
			HT	22					

Ramp R Right Turn

Total Vehicles	Truck %								
			Cars	352					
379	7		MT	9					
			HT	18					

Ramp P

Total Vehicles	Truck %								
			Cars	493					
530	7		MT	12		530			
			HT	25					

I-83 NB, between Ramp P and Ramp X

Total Vehicles	Truck %						individual lane (per 2 lanes)		MPH
			Cars	2414			Cars	1207	55
2840	15		MT	142		2840	MT	71	55
			HT	284			HT	142	55

I-83 NB, between Ramp X and Ramp V									
							individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	2261			Cars	1131	55
2660	15		MT	133		2660	MT	67	55
			HT	266			HT	133	55
I-83 NB, between Ramp V and Ramp W									
							individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	1692			Cars	846	55
1990	15		MT	100		1990	MT	50	55
			HT	199			HT	100	55
Ramp X									
Total Vehicles	Truck %		Cars	167					
180	7		MT	4		180			
			HT	8					
Ramp V									
Total Vehicles	Truck %		Cars	623					
670	7		MT	16		670			
			HT	31					
Ramp W									
Total Vehicles	Truck %		Cars	367					
395	7		MT	9		395			
			HT	18					
I-83 NB, Exit 21 to Exit 22									
							individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	2027			Cars	1014	55
2,385	15		MT	119		2385	MT	60	55
			HT	239			HT	119	55
I-83 NB, Between Ramp A and Ramp B									
							individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	1560			Cars	780	55
1,835	15		MT	92		1835	MT	46	55
			HT	184			HT	92	55
Ramp A									
Total Vehicles	Truck %		Cars	512					
550	7		MT	13		550			
			HT	26					
Ramp B									
Total Vehicles	Truck %		Cars	428					
460	7		MT	11		460			
			HT	21					
I-83 NB, north of Ramp B									
							individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	1951			Cars	975	55
2,295	15		MT	115		2295	MT	57	55
			HT	230			HT	115	55

I-83 SB, north of Ramp C										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	2287				Cars	1143	55
2,690	15		MT	135		2690		MT	67	55
			HT	269				HT	135	55
Ramp C										
Total Vehicles	Truck %		Cars	628						
675	7		MT	16		675				
			HT	32						
Ramp C Right turn										
Total Vehicles	Truck %		Cars	214						
230	7		MT	5		230				
			HT	11						
Ramp C thru										
Total Vehicles	Truck %		Cars	353						
380	7		MT	9		380				
			HT	18						
Ramp C left turn										
Total Vehicles	Truck %		Cars	14						
15	7		MT	0		15				
			HT	1						
Ramp D										
Total Vehicles	Truck %		Cars	284						
305	7		MT	7		305				
			HT	14						
I-83 SB, Exit 22 to Exit 21										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	2015				Cars	1007	55
2,370	15		MT	119		2370		MT	59	55
			HT	237				HT	119	55
I-83 SB, Between Ramp U and Ramp Y										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	2138				Cars	1069	55
2,515	15		MT	126		2515		MT	63	55
			HT	252				HT	126	55
I-83 SB, Between Ramp Y and Ramp Z										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	1883				Cars	941	55
2,215	15		MT	111		2215		MT	55	55
			HT	222				HT	111	55
Ramp U										
Total Vehicles	Truck %		Cars	135						
145	7		MT	3		145				
			HT	7						

Ramp Y										
Total Vehicles	Truck %		Cars	279						
300	7		MT	7		300				
			HT	14						
Ramp Z										
Total Vehicles	Truck %		Cars	698						
750	7		MT	18		750				
			HT	35						
I-83 SB, between Ramp Z and Ramp N										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	2520				Cars	1260	55
2,965	15		MT	148		2965		MT	74	55
			HT	297				HT	148	55
I-83 SB, between Ramp N and Ramp M										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	2376				Cars	1188	55
2,795	15		MT	140		2795		MT	70	55
			HT	280				HT	140	55
I-83 SB, between Ramp N and Ramp M										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	2933				Cars	1466	55
3,450	15		MT	173		3450		MT	86	55
			HT	345				HT	173	55
Ramp N										
Total Vehicles	Truck %		Cars	158						
170	7		MT	4		170				
			HT	8						
I-83 SB, between Ramp M and Ramp T										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	2652				Cars	1326	55
3,120	15		MT	156		3120		MT	78	55
			HT	312				HT	156	55
Ramp M										
Total Vehicles	Truck %		Cars	609						
655	7		MT	15		655				
			HT	31						
Ramp S										
Total Vehicles	Truck %		Cars	307						
330	7		MT	8		330				
			HT	15						
Ramp T										
Total Vehicles	Truck %		Cars	284						

305	7		MT	7		305				
			HT	14						
I-83 SB, south of Ramp T										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	2877				Cars	1439	55
3,425	16		MT	183		3425		MT	91	55
			HT	365				HT	183	55
North Hills Rd NB, between SR 0462 intersection and Ramp P										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	1099				Cars	550	55
1,145	4		MT	15		1145		MT	8	55
			HT	31				HT	15	55
North Hills Rd NB, between Ramp P and Industrial Hwy intersection										
Total Vehicles	Truck %		Cars	1536						
1,600	4		MT	21		1600				
			HT	43						
SR 0462 EB, west of Belmont St intersection										
Total Vehicles	Truck %		Cars	1099						
1145	4		MT	15		1145				
			HT	31						
SR 0462 EB, between Belmont St intersection and North Hills Rd intersection										
Total Vehicles	Truck %		Cars	1536						
1,600	4		MT	21		1600				
			HT	43						
SR 0462 EB, east of North Hills Rd intersection										
Total Vehicles	Truck %		Cars	1440						
1,500	4		MT	20		1500				
			HT	40						
SR 0462 WB, east of North Hills Rd intersection										
Total Vehicles	Truck %		Cars	1205						
1,255	4		MT	17		1255				
			HT	33						
SR 0462 WB, between Belmont St intersection and North Hills Rd intersection										
Total Vehicles	Truck %		Cars	1810						
1,885	4		MT	25		1885				
			HT	50						
SR 0462 WB, west of Belmont St intersection										
Total Vehicles	Truck %		Cars	955						
995	4		MT	13		995				
			HT	27						
North Hills Rd NB, between SR 0462 intersection and Ramp P										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	1006				Cars	503	35

1130	11		MT	41		1130		MT	21	35
			HT	83				HT	41	35
North Hills Rd NB, between Ramp P and Industrial Hwy intersection										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	668				Cars	334	35
750	11		MT	28		750		MT	14	35
			HT	55				HT	28	35
North Hills Rd NB, between Industrial Hwy intersection and US 30 intersection										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	641				Cars	320	35
720	11		MT	26		720		MT	13	35
			HT	53				HT	26	35
North Hills Rd SB, between US 30 intersection and Industrial Hwy intersection										
Total Vehicles	Truck %		Cars	672						
755	11		MT	28		755				
			HT	55						
North Hills Rd SB, between Industrial Hwy intersection and Ramp P										
Total Vehicles	Truck %		Cars	966						
1085	11		MT	40		1085				
			HT	80						
North Hills Rd SB, between Ramp P and SR 0462 intersection										
Total Vehicles	Truck %		Cars	841						
945	11		MT	35		945				
			HT	69						
Ramp R Thru										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	352				Cars	176	30
379	7		MT	9		379		MT	4	30
			HT	18				HT	9	30
SR 0462 Market St EB										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	1067				Cars	534	35
1199	11		MT	44		1199		MT	22	35
			HT	88				HT	44	35
Total Vehicles	Truck %		Cars	0						
			MT	0		0				
			HT	0						
SR 0462 EB, west of Belmont St intersection										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	1099				Cars	550	35
1,145	4		MT	15		1145		MT	8	35
			HT	31				HT	15	35
SR 0462 EB, between Belmont St intersection and North Hills Rd intersection										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	1536				Cars	768	35

1,600	4		MT	21		1600		MT	11	35
			HT	43				HT	21	35
SR 0462 EB, east of North Hills Rd intersection										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	1440				Cars	720	35
1,500	4		MT	20		1500		MT	10	35
			HT	40				HT	20	35
SR 0462 WB, east of North Hills Rd intersection										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	1205				Cars	602	35
1,255	4		MT	17		1255		MT	8	35
			HT	33				HT	17	35
SR 0462 WB, between Belmont St intersection and North Hills Rd intersection										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	1810				Cars	905	35
1,885	4		MT	25		1885		MT	13	35
			HT	50				HT	25	35
SR 0462 WB, west of Belmont St intersection										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	955				Cars	478	35
995	4		MT	13		995		MT	7	35
			HT	27				HT	13	35
North Hills Rd NB Market St to Ramp P										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	739				Cars	369	35
830	11		MT	30		830		MT	15	35
			HT	61				HT	30	35
Industrial Rd EB										
Total Vehicles	Truck %		Cars	280						
315	11		MT	11		315				
			HT	23						
Industrial Rd WB Right Turn and Thru										
Total Vehicles	Truck %		Cars	156						
175	11		MT	6		175				
			HT	13						
Industrial Rd WB Left Turn										
Total Vehicles	Truck %		Cars	383						
430	11		MT	16		430				
			HT	32						
N Belmont St NB north of SR 0462 intersection										
Total Vehicles	Truck %		Cars	13						
13	3		MT	0		13				
			HT	0						
N Belmont St SB north of SR 0462 intersection										
Total Vehicles	Truck %		Cars	143						

147	3		MT	1		147				
			HT	3						
S Belmont St SB from SR 0462 intersection to Ramp S/T										
Total Vehicles	Truck %		Cars	334						
344	3		MT	3		344				
			HT	7						
S Belmont St SB south of Ramp S/T										
Total Vehicles	Truck %		Cars	46						
47	3		MT	0		47				
			HT	1						
S Belmont St NB south of Ramp S/T										
Total Vehicles	Truck %		Cars	138						
142	3		MT	1		142				
			HT	3						
S Belmont St NB from Ramp S/T to SR 0462 intersection										
Total Vehicles	Truck %		Cars	401						
413	3		MT	4		413				
			HT	8						
N George St NB, between US 30 and Lightner Rd/Ramps C/D interchange										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	925				Cars	462	35
1,016	9		MT	30		1016		MT	15	35
			HT	61				HT	30	35
N George St NB, between Lightner Rd/Ramps C/D interchange and Ramps A/B										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	892				Cars	446	35
980	9		MT	29		980		MT	15	35
			HT	59				HT	29	35
N George St NB, north of Ramps A/B										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	742				Cars	371	35
815	9		MT	24		815		MT	12	35
			HT	49				HT	24	35
N George St SB, north of Ramps A/B										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	796				Cars	398	35
875	9		MT	26		875		MT	13	35
			HT	53				HT	26	35
N George St SB, between Ramps A/B and Lightner Rd/Ramps C/D interchange										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	1028				Cars	514	35
1,130	9		MT	34		1130		MT	17	35
			HT	68				HT	34	35
N George St SB, between Lightner Rd/Ramps C/D interchange and US 30										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	1007				Cars	504	35

1,107	9		MT	33		1107		MT	17	35
			HT	66				HT	33	35
Lightner St EB										
Total Vehicles	Truck %		Cars	396						
435	9		MT	13		435				
			HT	26						
Lightner St WB										
Total Vehicles	Truck %		Cars	387						
425	9		MT	13		425				
			HT	26						
Masonic Drive										
Total Vehicles	Truck %		Cars	116						
127	9		MT	4		127				
			HT	8						
N George NB										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	675				Cars	338	40
742	9		MT	22		742		MT	11	40
			HT	45				HT	22	40
US 30 EB, between George St and Ramp Z										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	2129				Cars	1065	40
2,340	9		MT	70		2340		MT	35	40
			HT	140				HT	70	40
US 30 EB, between Ramp Y and Toronita St										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	1399				Cars	700	40
1,590	12		MT	64		1590		MT	32	40
			HT	127				HT	64	40
US 30 EB, between Ramp Y and Toronita St										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	1822				Cars	911	40
2,070	12		MT	83		2070		MT	41	40
			HT	166				HT	83	40
US 30 EB, east of Toronita St										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	1690				Cars	845	40
1,920	12		MT	77		1920		MT	38	40
			HT	154				HT	77	40
US 30 WB, east of Toronita St										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	1769				Cars	884	40
1,965	10		MT	66		1965		MT	33	40
			HT	131				HT	66	40
US 30 WB, between Toronita St and Ramp W										
								individual lane (per 2 lanes)		MPH

Total Vehicles	Truck %		Cars	1890				Cars	945	40
2,100	10		MT	70		2100		MT	35	40
			HT	140				HT	70	40
US 30 WB, between Ramp W and Ramp U										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	2007				Cars	1004	40
2,230	10		MT	74		2230		MT	37	40
			HT	149				HT	74	40
US 30 WB, between Ramp U and George St										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	2029				Cars	1015	40
2,230	9		MT	67		2230		MT	33	40
			HT	134				HT	67	40
Toronita St , north of US 30										
Total Vehicles	Truck %		Cars	378						
485	22		MT	36		485				
			HT	71						
Toronita St, south of US 30										
Total Vehicles	Truck %		Cars	353						
380	7		MT	9		380				
			HT	18						
US 30 EB mainline, turning lanes thru										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	1607				Cars	803	40
1785	10		MT	60		1785		MT	30	40
			HT	119				HT	60	40
US 30 WB mainline, turning lanes thru										
								individual lane (per 2 lanes)		MPH
Total Vehicles	Truck %		Cars	1656				Cars	828	40
1840	10		MT	61		1840		MT	31	40
			HT	123				HT	61	40

I-83 North York Widening TNM Validation Traffic

I-83 NB TMS 1

Total Vehicles	
523	

	20 Minute	1 hour
Cars	398	1194
MT	36	108
HT	89	267

523

	individual lane (per 2 lanes)	MPH
Cars	597	55
MT	54	55
HT	134	55

I-83 SB TMS 1

Total Vehicles	
578	

	20 Minute	1 hour
Cars	432	1296
MT	45	135
HT	101	303

578

	individual lane (per 2 lanes)	MPH
Cars	648	55
MT	68	55
HT	152	55

I-83 NB TMS 2

Total Vehicles	
507	

	20 Minute	1 hour
Cars	377	1131
MT	39	117
HT	91	273

507

	individual lane (per 2 lanes)	MPH
Cars	566	55
MT	59	55
HT	137	55

I-83 SB TMS 2

Total Vehicles	
557	

	20 Minute	1 hour
Cars	410	1230
MT	36	108
HT	111	333

557

	individual lane (per 2 lanes)	MPH
Cars	615	55
MT	54	55
HT	167	55

US 30 EB

Total Vehicles	
488	

	20 Minute	1 hour
Cars	401	1203
MT	35	105
HT	52	156

488

	individual lane (per 2 lanes)	MPH
Cars	602	40
MT	53	40
HT	78	40

US 30 WB

Total Vehicles	
466	

	20 Minute	1 hour
Cars	388	1164
MT	45	135
HT	33	99

466

	individual lane (per 2 lanes)	MPH
Cars	582	40
MT	68	40
HT	50	40

Ramp W US 30 to NB I-83

Total Vehicles	
190	

	20 Minute	1 hour
Cars	170	510
MT	9	27
HT	11	33

190

	individual lane (per 2 lanes)	MPH
Cars	255	25
MT	14	25
HT	17	25

Ramp V I-83 to US 30 WB

Total Vehicles	
108	

	20 Minute	1 hour
Cars	76	228
MT	14	42
HT	18	54

108

	individual lane (per 2 lanes)	MPH
Cars	114	25
MT	21	25
HT	27	25

I-83 NB TMS 3

Total Vehicles	
592	

	20 Minute	1 hour
Cars	476	1428
MT	40	120
HT	76	228

592

	individual lane (per 2 lanes)	MPH
Cars	714	55
MT	60	55
HT	114	55

I-83 SB TMS 3

	20 Minute	1 hour

	individual lane (per 2 lanes)	MPH

Total Vehicles	
550	

	20 Minute	1 hour
Cars	460	1380
MT	36	108
HT	54	162

550

individual lane (per 2 lanes)		MPH
Cars	690	55
MT	54	55
HT	81	55

I-83 NB TMS 4

Total Vehicles	
628	

	20 Minute	1 hour
Cars	496	1488
MT	58	174
HT	74	222

628

individual lane (per 2 lanes)		MPH
Cars	744	55
MT	87	55
HT	111	55

I-83 SB TMS 4

Total Vehicles	
659	

	20 Minute	1 hour
Cars	542	1626
MT	49	147
HT	68	204

659

individual lane (per 2 lanes)		MPH
Cars	813	55
MT	74	55
HT	102	55

North Hills Rd NB

Total Vehicles	
300	

	20 Minute	1 hour
Cars	264	792
MT	20	60
HT	16	48

300

individual lane (per 2 lanes)		MPH
Cars	396	55
MT	30	55
HT	24	55

North Hills Rd SB

Total Vehicles	
254	

	20 Minute	1 hour
Cars	238	714
MT	12	36
HT	4	12

254

Ramp P

Total Vehicles	
172	

	20 Minute	1 hour
Cars	164	492
MT	6	18
HT	2	6

172

I-83 NB TMS 5

Total Vehicles	
539	

	20 Minute	1 hour
Cars	434	1302
MT	44	132
HT	61	183

539

individual lane (per 2 lanes)		MPH
Cars	651	55
MT	66	55
HT	92	55

I-83 SB TMS 5

Total Vehicles	
726	

	20 Minute	1 hour
Cars	624	1872
MT	35	105
HT	67	201

726

individual lane (per 2 lanes)		MPH
Cars	936	55
MT	53	55
HT	101	55

Ramp R

Total Vehicles	
288	

	20 Minute	1 hour
Cars	261	783
MT	15	45
HT	12	36

288

I-83 NB TMS 6

Total Vehicles	
529	

	20 Minute	1 hour
Cars	428	1284
MT	44	132
HT	57	171

529

individual lane (per 2 lanes)		MPH
Cars	642	55
MT	66	55
HT	86	55

I-83 SB TMS 6

Total Vehicles	
694	

20 Minute		1 hour
Cars	589	1767
MT	38	114
HT	67	201

694

individual lane (per 2 lanes)		MPH
Cars	884	55
MT	57	55
HT	101	55

I-83 North York Widening
2042 Design Year TNM Traffic Link Calculations

I-83 NB 01 (south of Ramp R)

Total Vehicles	Truck %
3555	16

Cars	2986
MT	190
HT	379

3555

individual lane (per 3 lanes)		MPH
Cars	995	65
MT	63	65
HT	126	65

I-83 NB 02 (Exit 19, after Ramp R split)

Total Vehicles	Truck %
2525	16

Cars	2121
MT	135
HT	269

2525

individual lane (per 3 lanes)		MPH
Cars	707	65
MT	45	65
HT	90	65

I-83 NB Ramp R

Total Vehicles	Truck %
1030	7

Cars	958
MT	24
HT	48

1030

individual lane (per 2 lanes)		MPH
Cars	479	35
MT	12	35
HT	24	35

I-83 NB Ramp Q

Total Vehicles	Truck %
305	7

Cars	284
MT	7
HT	14

305

individual lane (per 1 lane)		MPH
Cars	284	20
MT	7	20
HT	14	20

I-83 NB 03 (post Ramp Q merge)

Total Vehicles	Truck %
2835	15

Cars	2410
MT	142
HT	284

2835

individual lane (per 3 lanes)		MPH
Cars	803	65
MT	47	65
HT	95	65

I-83 NB Ramp V

Total Vehicles	Truck %
805	7

Cars	749
MT	19
HT	38

805

individual lane (per 1 lane)		MPH
Cars	749	35
MT	19	35
HT	38	35

I-83 NB 04 (post Ramp V merge)

Total Vehicles	Truck %
3540	15

Cars	3009
MT	177
HT	354

3540

individual lane (per 3 lanes)		MPH
Cars	1003	65
MT	59	65
HT	118	65

I-83 NB Ramp X

Total Vehicles	Truck %
175	7

Cars	163
MT	4
HT	8

175

individual lane (per 1 lane)		MPH
Cars	163	30
MT	4	30
HT	8	30

I-83 NB 05 (Exit 21, after Ramp X split)

Total Vehicles	Truck %
3365	15

Cars	2860
MT	168
HT	337

3365

individual lane (per 3 lanes)		MPH
Cars	953	65
MT	56	65
HT	112	65

I-83 SB 01 (post Ramp Z merge)

Total Vehicles	Truck %
3555	15

Cars	3022
MT	178
HT	356

3555

individual lane (per 3 lanes)		MPH
Cars	1007	65
MT	59	65
HT	119	65

I-83 SB Ramp N + Ramp U

Total Vehicles	Truck %
665	7

Cars	618
MT	16
HT	31

665

individual lane (per 1 lane)		MPH
Cars	618	35
MT	16	35
HT	31	35

I-83 SB 02 (after Ramp N + Ramp U split)

Total Vehicles	Truck %
2880	15

Cars	2448
MT	144
HT	288

2880

individual lane (per 3 lanes)		MPH
Cars	816	65
MT	48	65
HT	96	65

I-83 SB Ramp N

Total Vehicles	Truck %
165	7

Cars	153
MT	4
HT	8

165

individual lane (per 1 lane)		MPH
Cars	153	35
MT	4	35
HT	8	35

I-83 SB Ramp U

individual lane (per 1 lane)	MPH

I-83 North York Widening
2042 Design Year TNM Traffic Link Calculations

Total Vehicles	Truck %
500	7

Cars	465
MT	12
HT	23

500

Cars	465	35
MT	12	35
HT	23	35

I-83 SB Ramp M

Total Vehicles	Truck %
905	7

Cars	842
MT	21
HT	42

905

	individual lane (per 1 lane)	MPH
Cars	842	25
MT	21	25
HT	42	25

I-83 SB Ramp T

Total Vehicles	Truck %
35	7

Cars	33
MT	1
HT	2

35

	individual lane (per 1 lane)	MPH
Cars	33	35
MT	1	35
HT	2	35

I-83 SB Ramp M + Ramp T

Total Vehicles	Truck %
940	7

Cars	874
MT	22
HT	44

940

	individual lane (per 1 lanes)	MPH
Cars	874	65
MT	22	65
HT	44	65

I-83 SB 03 (south of Ramp T)

Total Vehicles	Truck %
3825	16

Cars	3213
MT	204
HT	408

3825

	individual lane (per 3 lanes)	MPH
Cars	1071	65
MT	68	65
HT	136	65

I-83 SB (north of Ramp C)

Total Vehicles	Truck %
3200	15

Cars	2720
MT	160
HT	320

3200

	individual lane (per 2 lanes)	MPH
Cars	1360	65
MT	80	65
HT	160	65

	dividual lane (per 3 lan	MPH
Cars	907	40
MT	53	40
HT	107	40

SR 8017 Ramp C (@ 30 MPH)

Total Vehicles	Truck %
765	7

Cars	711
MT	18
HT	36

765

	individual lane (per 2 lanes)	MPH
Cars	356	30
MT	9	30
HT	18	30

I-83 SB (Between Ramp C and Ramp D)

Total Vehicles	Truck %
2435	15

Cars	2070
MT	122
HT	244

2435

	individual lane (per 3 lanes)	MPH
Cars	690	65
MT	41	65
HT	81	65

SR 8017 Ramp D (@ 40 MPH)

Total Vehicles	Truck %
935	7

Cars	870
MT	22
HT	44

935

SR 8015 Ramp Y (@ 25 MPH)

Total Vehicles	Truck %
555	7

Cars	516
MT	13
HT	26

555

I-83 SB (+ Ramp D - Ramp Y)

Total Vehicles	Truck %
2815	15

Cars	2393
MT	141
HT	282

2815

	individual lane (per 3 lanes)	MPH
Cars	798	65
MT	47	65
HT	94	65

SR 8015 Ramp Z (@ 25 MPH)

Total Vehicles	Truck %
745	7

Cars	693
MT	17
HT	35

745

I-83 SB (south of Ramp Z)

Total Vehicles	Truck %
3555	15

Cars	3022
MT	178
HT	356

3555

	individual lane (per 3 lanes)	MPH
Cars	1007	65
MT	59	65
HT	119	65

I-83 NB (Between Ramp X and Ramp V)

Total Vehicles	Truck %
3365	15

Cars	2860
MT	168
HT	337

3365

	individual lane (per 3 lanes)	MPH
Cars	953	65
MT	56	65
HT	112	65

I-83 North York Widening
2042 Design Year TNM Traffic Link Calculations

SR 8015 Ramp X (@ 30 MPH)

Total Vehicles	Truck %
175	7

Cars	163
MT	4
HT	8

175

SR 8015 Ramp V (@ 25 MPH)

Total Vehicles	Truck %
1105	7

Cars	1028
MT	26
HT	52

1105

I-83 NB (Between Ramp V and Ramp W)

Total Vehicles	Truck %
2260	15

Cars	1921
MT	113
HT	226

2260

individual lane (per 3 lanes)		MPH
Cars	640	65
MT	38	65
HT	75	65

SR 8015 Ramp W (@ 35 MPH)

Total Vehicles	Truck %
300	7

Cars	279
MT	7
HT	14

300

I-83 NB (+ Ramp W - Ramp A)

Total Vehicles	Truck %
1970	15

Cars	1675
MT	99
HT	197

1970

individual lane (per 3 lanes)		MPH
Cars	558	65
MT	33	65
HT	66	65

dividual lane (per 2 lane		MPH
Cars	837	65
MT	49	65
HT	99	65

SR 8017 Ramp A (@ 40 MPH)

Total Vehicles	Truck %
590	7

Cars	549
MT	14
HT	28

590

SR 8017 Ramp E (@ 50 MPH)

Total Vehicles	Truck %
565	7

Cars	525
MT	13
HT	26

565

I-83 NB (after Ramp E)

Total Vehicles	Truck %
2600	15

Cars	2210
MT	130
HT	260

2600

individual lane (per 2 lanes)		MPH
Cars	1105	65
MT	65	65
HT	130	65

N George St NB, between US 30 and Ramp C/D roundabout

Total Vehicles	Truck %
1100	9

Cars	1001
MT	33
HT	66

1100

individual lane (per 2 lanes)		MPH
Cars	501	40
MT	17	40
HT	33	40

N George St SB, between US 30 and Ramp C/D roundabout

Total Vehicles	Truck %
925	9

Cars	842
MT	28
HT	56

925

individual lane (per 2 lanes)		MPH
Cars	421	40
MT	14	40
HT	28	40

N George St NB, between Ramp C/D roundabout and Lightner Rd roundabout

Total Vehicles	Truck %
1035	9

Cars	942
MT	31
HT	62

1035

individual lane (per 2 lanes)		MPH
Cars	471	40
MT	16	40
HT	31	40

N George St SB, between Lightner Rd roundabout and Ramp C/D roundabout

Total Vehicles	Truck %
930	9

Cars	846
MT	28
HT	56

930

individual lane (per 2 lanes)		MPH
Cars	423	40
MT	14	40
HT	28	40

N George St NB, between Lightner Rd roundabout and Ramp A roundabout

Total Vehicles	Truck %
1205	9

Cars	1097
MT	36
HT	72

1205

individual lane (per 2 lanes)		MPH
Cars	548	40
MT	18	40
HT	36	40

N George St SB, between Ramp A roundabout and Lightner Rd roundabout

Total Vehicles	Truck %

Cars	1229

individual lane (per 2 lanes)		MPH
Cars	614	40

1350	9

MT	41
HT	81

1350

MT	20	40
HT	41	40

Ramp C / D Roundabout

Total Vehicles	Truck %
2025	9

Cars	1843
MT	61
HT	122

2025

individual lane (per 2 lanes)		MPH
Cars	921	20
MT	30	20
HT	61	20

Lightner Rd Roundabout

Total Vehicles	Truck %
2555	9

Cars	2325
MT	77
HT	153

2555

individual lane (per 2 lanes)		MPH
Cars	1163	20
MT	38	20
HT	77	20

Ramp R left turn lane

Total Vehicles	Truck %
40	7

Cars	37
MT	1
HT	2

40

individual lane (per 1 lanes)		MPH
Cars	37	35
MT	1	35
HT	2	35

Ramp R through lanes

Total Vehicles	Truck %
617	7

Cars	574
MT	14
HT	29

617

individual lane (per 2 lanes)		MPH
Cars	287	35
MT	7	35
HT	14	35

Ramp R right turn lane

Total Vehicles	Truck %
375	7

Cars	349
MT	9
HT	18

375

individual lane (per 1 lanes)		MPH
Cars	349	35
MT	9	35
HT	18	35

Market Street EB (E of I-83, approaching North Hills Road) left turn lane to N Hills

Total Vehicles	Truck %
342	4

Cars	328
MT	5
HT	9

342

individual lane (per 1 lanes)		MPH
Cars	328	25
MT	5	25
HT	9	25

Market Street EB (E of I-83, approaching North Hills Road) through lanes (2)

Total Vehicles	Truck %
1371	4

Cars	1316
MT	18
HT	37

1371

individual lane (per 2 lanes)		MPH
Cars	658	35
MT	9	35
HT	18	35

Market Street EB (E of I-83, departing North Hills Road intersection)

Total Vehicles	Truck %
1765	4

Cars	1694
MT	24
HT	47

1765

individual lane (per 2 lanes)		MPH
Cars	847	35
MT	12	35
HT	24	35

Market Street WB (E of I-83, east of North Hills Road intersection) through lanes (2)

Total Vehicles	Truck %
1600	4

Cars	1536
MT	21
HT	43

1600

individual lane (per 2 lanes)		MPH
Cars	768	35
MT	11	35
HT	21	35

Market Street WB (E of I-83, approaching North Hills Road) right turn lane to N Hills

Total Vehicles	Truck %
346	4

Cars	332
MT	5
HT	9

346

individual lane (per 1 lanes)		MPH
Cars	332	35
MT	5	35
HT	9	35

Market Street WB (E of I-83, approaching North Hills Road) through lanes (2)

Total Vehicles	Truck %
1253	4

Cars	1203
MT	17
HT	33

1253

individual lane (per 2 lanes)		MPH
Cars	601	35
MT	8	35
HT	17	35

Market Street WB (E of I-83, departing North Hills Road intersection)

Total Vehicles	Truck %
2160	4

Cars	2074
MT	29
HT	58

2160

individual lane (per 2 lanes)		MPH
Cars	1037	35
MT	14	35
HT	29	35

North Hills Road SB approaching SR 0462, left turn to SR 0462 EB (1 lane)

Total Vehicles	Truck %
19	11

Cars	17
MT	1
HT	1

19

individual lane (per 1 lanes)		MPH
Cars	17	35
MT	1	35
HT	1	35

I-83 North York Widening
2042 Design Year TNM Traffic Link Calculations

North Hills Road SB approaching SR 0462, right turn to SR 0462 WB (2 lanes)

Total Vehicles	Truck %
867	11

Cars	772
MT	32
HT	64

867

individual lane (per 2 lanes)		MPH
Cars	386	35
MT	16	35
HT	32	35

North Hills Road NB, departing SR 0462 intersection (2 lanes)

Total Vehicles	Truck %
1305	11

Cars	1161
MT	48
HT	96

1305

individual lane (per 2 lanes)		MPH
Cars	581	35
MT	24	35
HT	48	35

North Hills Road NB, approaching Industrial Highway intersection (left turn lane)

Total Vehicles	Truck %
335	11

Cars	298
MT	12
HT	25

335

individual lane (per 1 lanes)		MPH
Cars	298	35
MT	12	35
HT	25	35

North Hills Road NB, approaching Industrial Highway intersection (2 lanes)

Total Vehicles	Truck %
869	11

Cars	773
MT	32
HT	64

869

individual lane (per 2 lanes)		MPH
Cars	387	35
MT	16	35
HT	32	35

North Hills Road SB, departing Industrial Highway intesection (2 lanes)

Total Vehicles	Truck %
890	11

Cars	792
MT	33
HT	65

890

individual lane (per 2 lanes)		MPH
Cars	396	35
MT	16	35
HT	33	35

Industrial Highway EB

Total Vehicles	Truck %
366	11

Cars	326
MT	13
HT	27

366

individual lane (per 1 lanes)		MPH
Cars	326	35
MT	13	35
HT	27	35

Industrial Highway WB - left turn lane

Total Vehicles	Truck %
294	11

Cars	262
MT	11
HT	22

294

individual lane (per 1 lanes)		MPH
Cars	262	35
MT	11	35
HT	22	35

Industrial Highway WB - right turn lane

Total Vehicles	Truck %
294	11

Cars	262
MT	11
HT	22

294

individual lane (per 1 lanes)		MPH
Cars	262	35
MT	11	35
HT	22	35

US 30 EB (between Ramp Y and Toronita St)

Total Vehicles	Truck %
2340	12

Cars	2059
MT	94
HT	187

2340

individual lane (per 3 lanes)		MPH
Cars	686	40
MT	31	40
HT	62	40

US 30 EB Toronita Street intersection appraoch - left turn lane to Toronita Street

Total Vehicles	Truck %
102	12

Cars	90
MT	4
HT	8

102

individual lane (per 1 lanes)		MPH
Cars	90	25
MT	4	25
HT	8	25

US 30 EB Toronita Street intersection approach - through lanes

Total Vehicles	Truck %
2075	12

Cars	1826
MT	83
HT	166

2075

individual lane (per 3 lanes)		MPH
Cars	609	40
MT	28	40
HT	55	40

US 30 EB Toronita Street intersection approach - right turn lane to Toronita Street

Total Vehicles	Truck %
163	12

Cars	143
MT	7
HT	13

163

individual lane (per 1 lanes)		MPH
Cars	143	25
MT	7	25
HT	13	25

US 30 EB Toronita Street intersection depart

Total Vehicles	Truck %
2315	12

Cars	2037
MT	93
HT	185

2315

individual lane (per 3 lanes)		MPH
Cars	679	40
MT	31	40
HT	62	40

Toronita Street SB (south of US 30)

Total Vehicles	Truck %
230	7

Cars	214
MT	5

230

individual lane (per 1 lanes)		MPH
Cars	214	35
MT	5	35

HT	11	

HT	11	35

Toronita St NB (south of US 30) left turn lane

Total Vehicles	Truck %
131	7

Cars	122
MT	3
HT	6

131

individual lane (per 1 lanes)		MPH
Cars	122	35
MT	3	35
HT	6	35

Toronita St NB (south of US 30) through lane

Total Vehicles	Truck %
145	7

Cars	135
MT	3
HT	7

145

individual lane (per 1 lanes)		MPH
Cars	135	35
MT	3	35
HT	7	35

Toronita St NB (south of US 30) right turn lane

Total Vehicles	Truck %
138	7

Cars	128
MT	3
HT	6

138

individual lane (per 1 lanes)		MPH
Cars	128	35
MT	3	35
HT	6	35

US 30 WB east of Toronita St

Total Vehicles	Truck %
1520	10

Cars	1368
MT	51
HT	101

1520

individual lane (per 2 lanes)		MPH
Cars	684	40
MT	25	40
HT	51	40

US 30 WB Toronita Street intersection approach - right turn lane to Toronita Street

Total Vehicles	Truck %
53	10

Cars	48
MT	2
HT	4

53

individual lane (per 1 lanes)		MPH
Cars	48	25
MT	2	25
HT	4	25

US 30 WB Toronita Street intersection approach - through lanes

Total Vehicles	Truck %
1410	10

Cars	1269
MT	47
HT	94

1410

individual lane (per 2 lanes)		MPH
Cars	635	40
MT	24	40
HT	47	40

US 30 WB Toronita Street intersection appraoch - left turn lane to Toronita Street

Total Vehicles	Truck %
54	10

Cars	49
MT	2
HT	4

54

individual lane (per 1 lanes)		MPH
Cars	49	25
MT	2	25
HT	4	25

US 30 WB Toronita Street intersection depart

Total Vehicles	Truck %
1765	10

Cars	1589
MT	59
HT	118

1765

individual lane (per 2 lanes)		MPH
Cars	794	40
MT	29	40
HT	59	40

US 30 WB west of ramp W

Total Vehicles	Truck %
1465	10

Cars	1319
MT	49
HT	98

1465

individual lane (per 2 lanes)		MPH
Cars	659	40
MT	24	40
HT	49	40

US 30 EB west of I-83, west of Ramp Y

Total Vehicles	Truck %
1875	9

Cars	1706
MT	56
HT	113

1875

individual lane (per 2 lanes)		MPH
Cars	853	40
MT	28	40
HT	56	40

US 30 WB west of Ramp V, west of I-83

Total Vehicles	Truck %
2570	10

Cars	2313
MT	86
HT	171

2570

individual lane (per 3 lanes)		MPH
Cars	771	40
MT	29	40
HT	57	40

US 30 WB - N George St intersection approach

Total Vehicles	Truck %
2570	10

Cars	2313
MT	86
HT	171

2570

individual lane (per 6 lanes)		MPH
Cars	386	40
MT	14	40
HT	29	40

N George St SB north of Ramp E

Total Vehicles	Truck %
900	9

Cars	819
MT	27
HT	54

900

individual lane (per 1 lanes)		MPH
Cars	819	40
MT	27	40
HT	54	40

APPENDIX E - WARRANTED, FEASIBLE, AND REASONABLE WORKSHEETS

Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet – Noise Wall

Date	5/1/2019
Project Name	I-83 North York Widening
County	York County
SR, Section	I-83, Section 0083, Section 070
Community Name and/or NSA #	NSA 01
Noise Wall Identification (i.e., Wall 1)	NSA 01

General

1. Type of project (new location, reconstruction, etc.):	widening and reconstruction
2. Total number of impacted receptor units in community	
Category A units impacted	
Category B units impacted	81
Category C units impacted	4
Category D units impacted (if interior analysis required)	
Category E units impacted	

Warranted

1. Community Documentation	
a. Date community was permitted (for new developments or developments planned for or under construction)	pre-dates highway improvements
b. Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	Environmental Document awaiting approval

c. Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of *CE, ROD, or FONSI, as appropriate* ."

X Yes ____ No

2. Criteria requiring consideration of noise abatement (note N/A if category is not impacted or present or analysis not required). A "yes" answer to any of the following three questions requires the consideration of noise abatement.

a. With the proposed project, are design year noise levels predicted to approach or exceed the NAC level(s) in Table 1? X Yes ____ No

b. With the proposed project, is there predicted to be a substantial design year noise level increase of 10 dB(A) or more at Activity Category A, B, C, D, or E receptor(s)? ____ Yes X No

c. With the proposed project, are design year noise levels predicted to be less than existing noise levels, but still approach or exceed the NAC levels in Table 1 for the relevant Activity Category? ____ Yes X No

Feasibility – Questions 1c through 7 must all be answered "yes" for a noise barrier to be determined to be feasible.

1. Impacted receptor units			
a. Total number of impacted receptor units:	85		
b. Percentage of impacted receptor units receiving 5 dB(A) or more insertion loss:	100		
c. Is the percentage 50 or greater?	X Yes		No
2. Can the noise wall be designed and physically constructed at the proposed location?	X Yes		No
3. Can the noise wall be constructed without causing a safety problem?	X Yes		No
4. Can the noise wall be constructed without restricting access to vehicular or pedestrian travel?	X Yes		No
5. Can the noise wall be constructed in a manner that allows for access for required maintenance and inspection operations?	X Yes		No
6. Can the noise wall be constructed in a manner that permits utilities to function in a normal manner?	X Yes		No
7. Can the noise wall be constructed in a manner that permits drainage features to function in a normal manner?	X Yes		No

Reasonableness

1. Community Desires Related to the Barrier			
a. Do at least 50 percent of the responding benefited receptor unit owner(s) and renters desire the noise wall? If yes, continue with Reasonableness questions. If no, the noise wall can be considered not to be reasonable. Proceed to "Decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the benefited receptor unit owners do not desire the noise wall."		Yes	No
2. Square Footage Per Benefited Receptor (SF/BR) Evaluation			
a. Area (SF) of the proposed noise wall	71,464		
b. Number of benefited receptor units (any unit receiving 5 dB(A) or more insertion loss)	140		
c. SF/BR = 2a/2b	510		
d. Is 2c less than or equal to the MaxSF/BR value of 2000?	X Yes		No
3. Noise Reduction Design Goals (Activity Categories A, B, C, and E) A "yes" answer is required to Question 3a. for the noise wall to be determined to be reasonable. Questions 3b through 3e represent desirable goals that need not be met for a noise wall to be determined reasonable. However, they must be addressed and should be considered in the determination of the recommended noise wall.			
a. Does the noise wall reduce design year exterior noise levels by at least 7 dB(A) for at least one benefited receptor?	X Yes		No

b. Does the noise wall provide an insertion loss of at least 7 dB(A) for more receptors than required under 3a.while still conforming to the MaxSF/BR value of 2,000 and a "point of diminishing returns" evaluation? X Yes ____ No

c. Does the noise wall provide insertion losses of greater than 7 dB(A) while still conforming to the MaxSF/BR value of 2,000 and a "point of diminishing returns" evaluation? X Yes ____ No

d. Does the noise wall reduce future exterior levels to the low-60-decibel range (60-63) for Category B and C receptors and the upper-60 dB(A) range (65-68) for Category E receptors? X Yes ____ No

e. Does the noise wall reduce design year noise levels back to existing levels? X Yes ____ No

4. Noise Reduction Design Goals (Activity Category D) A "yes" answer is required to Question 4a. for the barrier to be determined to be reasonable. Question 4b represents a desirable goal that need not be met for a noise wall to be determined reasonable. However, this goal must be addressed and should be considered in the determination of the recommended noise wall.

a. Does noise wall reduce design year interior noise levels by at least 7 dB(A) for the facility's analysis point? ____ Yes ____ No

b. While conforming to the MaxSF/BR criteria and justified by a "point of diminishing returns' evaluation, does the noise wall provide an interior insertion loss above the 7 dB(A) minimum ____ Yes ____ No

Decision

Is the Noise Wall WARRANTED? X Yes ____ No

Is the Noise Wall FEASIBLE? X Yes ____ No

Is the Noise Wall REASONABLE? X Yes ____ No

Additional Reasons for Decision:

Responsible/Qualified Individuals Making the Above Decisions

PennDOT, Engineering District Environmental Manager — Date

Alan J. Dunay, Acoustical Scientist, Skelly & Loy, Inc. — 5/1/2019

Qualified Professional Performing the Analysis (name, title, and company name) — Date

Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet – Noise Wall

Date	5/1/2019
Project Name	I-83 North York Widening
County	York County
SR, Section	I-83, Section 0083, Section 070
Community Name and/or NSA #	NSA 02
Noise Wall Identification (i.e., Wall 1)	NSA 02

General

1. Type of project (new location, reconstruction, etc.):	widening and reconstruction

2. Total number of impacted receptor units in community

Category A units impacted	
Category B units impacted	36
Category C units impacted	
Category D units impacted (if interior analysis required)	
Category E units impacted	

Warranted

1. Community Documentation	
a. Date community was permitted (for new developments or developments planned for or under construction)	pre-dates highway improvements
b. Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	Environmental Document awaiting approval

c. Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of *CE, ROD, or FONSI, as appropriate* ."

X Yes ____ No

2. Criteria requiring consideration of noise abatement (note N/A if category is not impacted or present or analysis not required). A "yes" answer to any of the following three questions requires the consideration of noise abatement.

a. With the proposed project, are design year noise levels predicted to approach or exceed the NAC level(s) in Table 1? X Yes ____ No

b. With the proposed project, is there predicted to be a substantial design year noise level increase of 10 dB(A) or more at Activity Category A, B, C, D, or E receptor(s)? ____ Yes X No

c. With the proposed project, are design year noise levels predicted to be less than existing noise levels, but still approach or exceed the NAC levels in Table 1 for the relevant Activity Category? ____ Yes X No

Feasibility – Questions 1c through 7 must all be answered "yes" for a noise barrier to be determined to be feasible.

1. Impacted receptor units		
a. Total number of impacted receptor units:	36	
b. Percentage of impacted receptor units receiving 5 dB(A) or more insertion loss:	89	
c. Is the percentage 50 or greater?	X Yes	No
2. Can the noise wall be designed and physically constructed at the proposed location?	X Yes	No
3. Can the noise wall be constructed without causing a safety problem?	X Yes	No
4. Can the noise wall be constructed without restricting access to vehicular or pedestrian travel?	X Yes	No
5. Can the noise wall be constructed in a manner that allows for access for required maintenance and inspection operations?	X Yes	No
6. Can the noise wall be constructed in a manner that permits utilities to function in a normal manner?	X Yes	No
7. Can the noise wall be constructed in a manner that permits drainage features to function in a normal manner?	X Yes	No

Reasonableness

1. Community Desires Related to the Barrier		
a. Do at least 50 percent of the responding benefited receptor unit owner(s) and renters desire the noise wall? If yes, continue with Reasonableness questions. If no, the noise wall can be considered not to be reasonable. Proceed to "Decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the benefited receptor unit owners do not desire the noise wall."	Yes	No
2. Square Footage Per Benefited Receptor (SF/BR) Evaluation		
a. Area (SF) of the proposed noise wall	35,799	
b. Number of benefited receptor units (any unit receiving 5 dB(A) or more insertion loss)	60	
c. SF/BR = 2a/2b	597	
d. Is 2c less than or equal to the MaxSF/BR value of 2000?	X Yes	No
3. Noise Reduction Design Goals (Activity Categories A, B, C, and E) A "yes" answer is required to Question 3a. for the noise wall to be determined to be reasonable. Questions 3b through 3e represent desirable goals that need not be met for a noise wall to be determined reasonable. However, they must be addressed and should be considered in the determination of the recommended noise wall.		
a. Does the noise wall reduce design year exterior noise levels by at least 7 dB(A) for at least one benefited receptor?	X Yes	No

b. Does the noise wall provide an insertion loss of at least 7 dB(A) for more receptors than required under 3a.while still conforming to the MaxSF/BR value of 2,000 and a "point of diminishing returns" evaluation? X Yes ____ No

c. Does the noise wall provide insertion losses of greater than 7 dB(A) while still conforming to the MaxSF/BR value of 2,000 and a "point of diminishing returns" evaluation? X Yes ____ No

d. Does the noise wall reduce future exterior levels to the low-60-decibel range (60-63) for Category B and C receptors and the upper-60 dB(A) range (65-68) for Category E receptors? X Yes ____ No

e. Does the noise wall reduce design year noise levels back to existing levels? X Yes ____ No

4. Noise Reduction Design Goals (Activity Category D) A "yes" answer is required to Question 4a. for the barrier to be determined to be reasonable. Question 4b represents a desirable goal that need not be met for a noise wall to be determined reasonable. However, this goal must be addressed and should be considered in the determination of the recommended noise wall.

a. Does noise wall reduce design year interior noise levels by at least 7 dB(A) for the facility's analysis point? ____ Yes ____ No

b. While conforming to the MaxSF/BR criteria and justified by a "point of diminishing returns' evaluation, does the noise wall provide an interior insertion loss above the 7 dB(A) minimum ____ Yes ____ No

Decision

Is the Noise Wall WARRANTED? X Yes ____ No

Is the Noise Wall FEASIBLE? X Yes ____ No

Is the Noise Wall REASONABLE? X Yes ____ No

Additional Reasons for Decision:

Responsible/Qualified Individuals Making the Above Decisions

PennDOT, Engineering District Environmental Manager — Date

Alan J. Dunay, Acoustical Scientist, Skelly & Loy, Inc. — 5/1/2019

Qualified Professional Performing the Analysis (name, title, and company name) — Date

Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet – Noise Wall

Date	5/1/2019
Project Name	I-83 North York Widening
County	York County
SR, Section	I-83, Section 0083, Section 070
Community Name and/or NSA #	NSA 03/04
Noise Wall Identification (i.e., Wall 1)	NSA 03/04

General

1. Type of project (new location, reconstruction, etc.):	widening and reconstruction
2. Total number of impacted receptor units in community	
Category A units impacted	
Category B units impacted	13
Category C units impacted	
Category D units impacted (if interior analysis required)	
Category E units impacted	

Warranted

1. Community Documentation		
a. Date community was permitted (for new developments or developments planned for or under construction)	pre-dates highway improvements	
b. Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	Environmental Document awaiting approval	
c. Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of *CE, ROD, or FONSI, as appropriate* ."	X Yes	No
2. Criteria requiring consideration of noise abatement (note N/A if category is not impacted or present or analysis not required). A "yes" answer to any of the following three questions requires the consideration of noise abatement.		
a. With the proposed project, are design year noise levels predicted to approach or exceed the NAC level(s) in Table 1?	X Yes	No
b. With the proposed project, is there predicted to be a substantial design year noise level increase of 10 dB(A) or more at Activity Category A, B, C, D, or E receptor(s)?	Yes	X No
c. With the proposed project, are design year noise levels predicted to be less than existing noise levels, but still approach or exceed the NAC levels in Table 1 for the relevant Activity Category?	Yes	X No

Feasibility – Questions 1c through 7 must all be answered "yes" for a noise barrier to be determined to be feasible.

1. Impacted receptor units			
a. Total number of impacted receptor units:	13		
b. Percentage of impacted receptor units receiving 5 dB(A) or more insertion loss:	100		
c. Is the percentage 50 or greater?	X Yes		No
2. Can the noise wall be designed and physically constructed at the proposed location?	X Yes		No
3. Can the noise wall be constructed without causing a safety problem?	X Yes		No
4. Can the noise wall be constructed without restricting access to vehicular or pedestrian travel?	X Yes		No
5. Can the noise wall be constructed in a manner that allows for access for required maintenance and inspection operations?	X Yes		No
6. Can the noise wall be constructed in a manner that permits utilities to function in a normal manner?	X Yes		No
7. Can the noise wall be constructed in a manner that permits drainage features to function in a normal manner?	X Yes		No

Reasonableness

1. Community Desires Related to the Barrier			
a. Do at least 50 percent of the responding benefited receptor unit owner(s) and renters desire the noise wall? If yes, continue with Reasonableness questions. If no, the noise wall can be considered not to be reasonable. Proceed to "Decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the benefited receptor unit owners do not desire the noise wall."		Yes	No
2. Square Footage Per Benefited Receptor (SF/BR) Evaluation			
a. Area (SF) of the proposed noise wall	44,249		
b. Number of benefited receptor units (any unit receiving 5 dB(A) or more insertion loss)	35		
c. SF/BR = 2a/2b	1,264		
d. Is 2c less than or equal to the MaxSF/BR value of 2000?	X Yes		No
3. Noise Reduction Design Goals (Activity Categories A, B, C, and E) A "yes" answer is required to Question 3a. for the noise wall to be determined to be reasonable. Questions 3b through 3e represent desirable goals that need not be met for a noise wall to be determined reasonable. However, they must be addressed and should be considered in the determination of the recommended noise wall.			
a. Does the noise wall reduce design year exterior noise levels by at least 7 dB(A) for at least one benefited receptor?	X Yes		No

b. Does the noise wall provide an insertion loss of at least 7 dB(A) for more receptors than required under 3a.while still conforming to the MaxSF/BR value of 2,000 and a "point of diminishing returns" evaluation? X Yes ____ No

c. Does the noise wall provide insertion losses of greater than 7 dB(A) while still conforming to the MaxSF/BR value of 2,000 and a "point of diminishing returns" evaluation? X Yes ____ No

d. Does the noise wall reduce future exterior levels to the low-60-decibel range (60-63) for Category B and C receptors and the upper-60 dB(A) range (65-68) for Category E receptors? X Yes ____ No

e. Does the noise wall reduce design year noise levels back to existing levels? X Yes ____ No

4. Noise Reduction Design Goals (Activity Category D) A "yes" answer is required to Question 4a. for the barrier to be determined to be reasonable. Question 4b represents a desirable goal that need not be met for a noise wall to be determined reasonable. However, this goal must be addressed and should be considered in the determination of the recommended noise wall.

a. Does noise wall reduce design year interior noise levels by at least 7 dB(A) for the facility's analysis point? ____ Yes ____ No

b. While conforming to the MaxSF/BR criteria and justified by a "point of diminishing returns' evaluation, does the noise wall provide an interior insertion loss above the 7 dB(A) minimum ____ Yes ____ No

Decision

Is the Noise Wall WARRANTED? X Yes ____ No

Is the Noise Wall FEASIBLE? X Yes ____ No

Is the Noise Wall REASONABLE? X Yes ____ No

Additional Reasons for Decision:

Responsible/Qualified Individuals Making the Above Decisions

PennDOT, Engineering District Environmental Manager — Date

Alan J. Dunay, Acoustical Scientist, Skelly & Loy, Inc. — 5/1/2019

Qualified Professional Performing the Analysis (name, title, and company name) — Date

Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet – Noise Wall

Date	5/1/2019
Project Name	I-83 North York Widening
County	York County
SR, Section	I-83, Section 0083, Section 070
Community Name and/or NSA #	NSA 09
Noise Wall Identification (i.e., Wall 1)	NSA 09

General

1. Type of project (new location, reconstruction, etc.):	widening and reconstruction
2. Total number of impacted receptor units in community	
Category A units impacted	
Category B units impacted	4
Category C units impacted	
Category D units impacted (if interior analysis required)	
Category E units impacted	

Warranted

1. Community Documentation	
a. Date community was permitted (for new developments or developments planned for or under construction)	pre-dates highway improvements
b. Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	Environmental Document awaiting approval

c. Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of *CE, ROD, or FONSI, as appropriate* ."

X Yes ____ No

2. Criteria requiring consideration of noise abatement (note N/A if category is not impacted or present or analysis not required). A "yes" answer to any of the following three questions requires the consideration of noise abatement.

a. With the proposed project, are design year noise levels predicted to approach or exceed the NAC level(s) in Table 1? X Yes ____ No

b. With the proposed project, is there predicted to be a substantial design year noise level increase of 10 dB(A) or more at Activity Category A, B, C, D, or E receptor(s)? ____ Yes X No

c. With the proposed project, are design year noise levels predicted to be less than existing noise levels, but still approach or exceed the NAC levels in Table 1 for the relevant Activity Category? ____ Yes X No

Feasibility – Questions 1c through 7 must all be answered "yes" for a noise barrier to be determined to be feasible.

1. Impacted receptor units		
a. Total number of impacted receptor units:	4	
b. Percentage of impacted receptor units receiving 5 dB(A) or more insertion loss:	75	
c. Is the percentage 50 or greater?	X Yes	No
2. Can the noise wall be designed and physically constructed at the proposed location?	Yes	X No
3. Can the noise wall be constructed without causing a safety problem?	Yes	No
4. Can the noise wall be constructed without restricting access to vehicular or pedestrian travel?	Yes	No
5. Can the noise wall be constructed in a manner that allows for access for required maintenance and inspection operations?	Yes	No
6. Can the noise wall be constructed in a manner that permits utilities to function in a normal manner?	Yes	No
7. Can the noise wall be constructed in a manner that permits drainage features to function in a normal manner?	Yes	No

Reasonableness

1. Community Desires Related to the Barrier		
a. Do at least 50 percent of the responding benefited receptor unit owner(s) and renters desire the noise wall? If yes, continue with Reasonableness questions. If no, the noise wall can be considered not to be reasonable. Proceed to "Decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the benefited receptor unit owners do not desire the noise wall."	Yes	No
2. Square Footage Per Benefited Receptor (SF/BR) Evaluation		
a. Area (SF) of the proposed noise wall		
b. Number of benefited receptor units (any unit receiving 5 dB(A) or more insertion loss)		
c. SF/BR = 2a/2b		
d. Is 2c less than or equal to the MaxSF/BR value of 2000?	Yes	No
3. Noise Reduction Design Goals (Activity Categories A, B, C, and E) A "yes" answer is required to Question 3a. for the noise wall to be determined to be reasonable. Questions 3b through 3e represent desirable goals that need not be met for a noise wall to be determined reasonable. However, they must be addressed and should be considered in the determination of the recommended noise wall.		
a. Does the noise wall reduce design year exterior noise levels by at least 7 dB(A) for at least one benefited receptor?	Yes	No

b. Does the noise wall provide an insertion loss of at least 7 dB(A) for more receptors than required under 3a.while still conforming to the MaxSF/BR value of 2,000 and a "point of diminishing returns" evaluation? _____ Yes _____ No

c. Does the noise wall provide insertion losses of greater than 7 dB(A) while still conforming to the MaxSF/BR value of 2,000 and a "point of diminishing returns" evaluation? _____ Yes _____ No

d. Does the noise wall reduce future exterior levels to the low-60-decibel range (60-63) for Category B and C receptors and the upper-60 dB(A) range (65-68) for Category E receptors? _____ Yes _____ No

e. Does the noise wall reduce design year noise levels back to existing levels? _____ Yes _____ No

4. Noise Reduction Design Goals (Activity Category D) A "yes" answer is required to Question 4a. for the barrier to be determined to be reasonable. Question 4b represents a desirable goal that need not be met for a noise wall to be determined reasonable. However, this goal must be addressed and should be considered in the determination of the recommended noise wall.

a. Does noise wall reduce design year interior noise levels by at least 7 dB(A) for the facility's analysis point? _____ Yes _____ No

b. While conforming to the MaxSF/BR criteria and justified by a "point of diminishing returns' evaluation, does the noise wall provide an interior insertion loss above the 7 dB(A) minimum _____ Yes _____ No

Decision

Is the Noise Wall WARRANTED? X Yes _____ No

Is the Noise Wall FEASIBLE? _____ Yes X No

Is the Noise Wall REASONABLE? _____ Yes _____ No

Additional Reasons for Decision:

Responsible/Qualified Individuals Making the Above Decisions

PennDOT, Engineering District Environmental Manager — Date

Alan J. Dunay, Acoustical Scientist, Skelly & Loy, Inc. — 5/1/2019

Qualified Professional Performing the Analysis (name, title, and company name) — Date

Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet – Noise Wall

Date	5/1/2019
Project Name	I-83 North York Widening
County	York County
SR, Section	I-83, Section 0083, Section 070
Community Name and/or NSA #	NSA 10
Noise Wall Identification (i.e., Wall 1)	NSA 10

General

1. Type of project (new location, reconstruction, etc.):	widening and reconstruction

2. Total number of impacted receptor units in community

Category A units impacted	
Category B units impacted	5
Category C units impacted	
Category D units impacted (if interior analysis required)	
Category E units impacted	

Warranted

1. Community Documentation

a. Date community was permitted (for new developments or developments planned for or under construction)	pre-dates highway improvements
b. Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	Environmental Document awaiting approval

c. Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of *CE, ROD, or FONSI, as appropriate* ."

X Yes ____ No

2. Criteria requiring consideration of noise abatement (note N/A if category is not impacted or present or analysis not required). A "yes" answer to any of the following three questions requires the consideration of noise abatement.

a. With the proposed project, are design year noise levels predicted to approach or exceed the NAC level(s) in Table 1? X Yes ____ No

b. With the proposed project, is there predicted to be a substantial design year noise level increase of 10 dB(A) or more at Activity Category A, B, C, D, or E receptor(s)? ____ Yes X No

c. With the proposed project, are design year noise levels predicted to be less than existing noise levels, but still approach or exceed the NAC levels in Table 1 for the relevant Activity Category? ____ Yes X No

Feasibility – Questions 1c through 7 must all be answered "yes" for a noise barrier to be determined to be feasible.

1. Impacted receptor units		
a. Total number of impacted receptor units:	5	
b. Percentage of impacted receptor units receiving 5 dB(A) or more insertion loss:	60	
c. Is the percentage 50 or greater?	X Yes	No
2. Can the noise wall be designed and physically constructed at the proposed location?	X Yes	No
3. Can the noise wall be constructed without causing a safety problem?	X Yes	No
4. Can the noise wall be constructed without restricting access to vehicular or pedestrian travel?	X Yes	No
5. Can the noise wall be constructed in a manner that allows for access for required maintenance and inspection operations?	X Yes	No
6. Can the noise wall be constructed in a manner that permits utilities to function in a normal manner?	X Yes	No
7. Can the noise wall be constructed in a manner that permits drainage features to function in a normal manner?	X Yes	No

Reasonableness

1. Community Desires Related to the Barrier		
a. Do at least 50 percent of the responding benefited receptor unit owner(s) and renters desire the noise wall? If yes, continue with Reasonableness questions. If no, the noise wall can be considered not to be reasonable. Proceed to "Decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the benefited receptor unit owners do not desire the noise wall."	Yes	No
2. Square Footage Per Benefited Receptor (SF/BR) Evaluation		
a. Area (SF) of the proposed noise wall	13,960	
b. Number of benefited receptor units (any unit receiving 5 dB(A) or more insertion loss)	3	
c. SF/BR = 2a/2b	4,653	
d. Is 2c less than or equal to the MaxSF/BR value of 2000?	Yes	X No
3. Noise Reduction Design Goals (Activity Categories A, B, C, and E) A "yes" answer is required to Question 3a. for the noise wall to be determined to be reasonable. Questions 3b through 3e represent desirable goals that need not be met for a noise wall to be determined reasonable. However, they must be addressed and should be considered in the determination of the recommended noise wall.		
a. Does the noise wall reduce design year exterior noise levels by at least 7 dB(A) for at least one benefited receptor?	Yes	No

b. Does the noise wall provide an insertion loss of at least 7 dB(A) for more receptors than required under 3a.while still conforming to the MaxSF/BR value of 2,000 and a "point of diminishing returns" evaluation? _____ Yes _____ No

c. Does the noise wall provide insertion losses of greater than 7 dB(A) while still conforming to the MaxSF/BR value of 2,000 and a "point of diminishing returns" evaluation? _____ Yes _____ No

d. Does the noise wall reduce future exterior levels to the low-60-decibel range (60-63) for Category B and C receptors and the upper-60 dB(A) range (65-68) for Category E receptors? _____ Yes _____ No

e. Does the noise wall reduce design year noise levels back to existing levels? _____ Yes _____ No

4. Noise Reduction Design Goals (Activity Category D) A "yes" answer is required to Question 4a. for the barrier to be determined to be reasonable. Question 4b represents a desirable goal that need not be met for a noise wall to be determined reasonable. However, this goal must be addressed and should be considered in the determination of the recommended noise wall.

a. Does noise wall reduce design year interior noise levels by at least 7 dB(A) for the facility's analysis point? _____ Yes _____ No

b. While conforming to the MaxSF/BR criteria and justified by a "point of diminishing returns' evaluation, does the noise wall provide an interior insertion loss above the 7 dB(A) minimum _____ Yes _____ No

Decision

Is the Noise Wall WARRANTED? X Yes _____ No

Is the Noise Wall FEASIBLE? X Yes _____ No

Is the Noise Wall REASONABLE? _____ Yes X No

Additional Reasons for Decision:

Responsible/Qualified Individuals Making the Above Decisions

PennDOT, Engineering District Environmental Manager — Date

Alan J. Dunay, Acoustical Scientist, Skelly & Loy, Inc. — 5/1/2019

Qualified Professional Performing the Analysis (name, title, and company name) — Date

Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet – Noise Wall

Date	5/1/2019
Project Name	I-83 North York Widening
County	York County
SR, Section	I-83, Section 0083, Section 070
Community Name and/or NSA #	NSA 13
Noise Wall Identification (i.e., Wall 1)	NSA 13

General

1. Type of project (new location, reconstruction, etc.):	widening and reconstruction

2. Total number of impacted receptor units in community

Category A units impacted	
Category B units impacted	2
Category C units impacted	
Category D units impacted (if interior analysis required)	
Category E units impacted	

Warranted

1. Community Documentation	
a. Date community was permitted (for new developments or developments planned for or under construction)	pre-dates highway improvements
b. Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	Environmental Document awaiting approval

c. Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of *CE, ROD, or FONSI, as appropriate* ."

X Yes ____ No

2. Criteria requiring consideration of noise abatement (note N/A if category is not impacted or present or analysis not required). A "yes" answer to any of the following three questions requires the consideration of noise abatement.

a. With the proposed project, are design year noise levels predicted to approach or exceed the NAC level(s) in Table 1? X Yes ____ No

b. With the proposed project, is there predicted to be a substantial design year noise level increase of 10 dB(A) or more at Activity Category A, B, C, D, or E receptor(s)? ____ Yes X No

c. With the proposed project, are design year noise levels predicted to be less than existing noise levels, but still approach or exceed the NAC levels in Table 1 for the relevant Activity Category? ____ Yes X No

Feasibility – Questions 1c through 7 must all be answered "yes" for a noise barrier to be determined to be feasible.

1. Impacted receptor units			
a. Total number of impacted receptor units:	2		
b. Percentage of impacted receptor units receiving 5 dB(A) or more insertion loss:	100		
c. Is the percentage 50 or greater?	X Yes		No
2. Can the noise wall be designed and physically constructed at the proposed location?	X Yes		No
3. Can the noise wall be constructed without causing a safety problem?	X Yes		No
4. Can the noise wall be constructed without restricting access to vehicular or pedestrian travel?	X Yes		No
5. Can the noise wall be constructed in a manner that allows for access for required maintenance and inspection operations?	X Yes		No
6. Can the noise wall be constructed in a manner that permits utilities to function in a normal manner?	X Yes		No
7. Can the noise wall be constructed in a manner that permits drainage features to function in a normal manner?	X Yes		No

Reasonableness

1. Community Desires Related to the Barrier			
a. Do at least 50 percent of the responding benefited receptor unit owner(s) and renters desire the noise wall? If yes, continue with Reasonableness questions. If no, the noise wall can be considered not to be reasonable. Proceed to "Decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the benefited receptor unit owners do not desire the noise wall."		Yes	No
2. Square Footage Per Benefited Receptor (SF/BR) Evaluation			
a. Area (SF) of the proposed noise wall	25,420		
b. Number of benefited receptor units (any unit receiving 5 dB(A) or more insertion loss)	6		
c. SF/BR = 2a/2b	4,237		
d. Is 2c less than or equal to the MaxSF/BR value of 2000?		Yes	X No
3. Noise Reduction Design Goals (Activity Categories A, B, C, and E) A "yes" answer is required to Question 3a. for the noise wall to be determined to be reasonable. Questions 3b through 3e represent desirable goals that need not be met for a noise wall to be determined reasonable. However, they must be addressed and should be considered in the determination of the recommended noise wall.			
a. Does the noise wall reduce design year exterior noise levels by at least 7 dB(A) for at least one benefited receptor?		Yes	No

b. Does the noise wall provide an insertion loss of at least 7 dB(A) for more receptors than required under 3a.while still conforming to the MaxSF/BR value of 2,000 and a "point of diminishing returns" evaluation? _____ Yes _____ No

c. Does the noise wall provide insertion losses of greater than 7 dB(A) while still conforming to the MaxSF/BR value of 2,000 and a "point of diminishing returns" evaluation? _____ Yes _____ No

d. Does the noise wall reduce future exterior levels to the low-60-decibel range (60-63) for Category B and C receptors and the upper-60 dB(A) range (65-68) for Category E receptors? _____ Yes _____ No

e. Does the noise wall reduce design year noise levels back to existing levels? _____ Yes _____ No

4. Noise Reduction Design Goals (Activity Category D) A "yes" answer is required to Question 4a. for the barrier to be determined to be reasonable. Question 4b represents a desirable goal that need not be met for a noise wall to be determined reasonable. However, this goal must be addressed and should be considered in the determination of the recommended noise wall.

a. Does noise wall reduce design year interior noise levels by at least 7 dB(A) for the facility's analysis point? _____ Yes _____ No

b. While conforming to the MaxSF/BR criteria and justified by a "point of diminishing returns' evaluation, does the noise wall provide an interior insertion loss above the 7 dB(A) minimum _____ Yes _____ No

Decision

Is the Noise Wall WARRANTED? X Yes _____ No

Is the Noise Wall FEASIBLE? X Yes _____ No

Is the Noise Wall REASONABLE? _____ Yes X No

Additional Reasons for Decision:

Responsible/Qualified Individuals Making the Above Decisions

PennDOT, Engineering District Environmental Manager — Date

Alan J. Dunay, Acoustical Scientist, Skelly & Loy, Inc. — 5/1/2019

Qualified Professional Performing the Analysis (name, title, and company name) — Date

Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet – Noise Wall

Date	5/1/2019
Project Name	I-83 North York Widening
County	York County
SR, Section	I-83, Section 0083, Section 070
Community Name and/or NSA #	NSA 14
Noise Wall Identification (i.e., Wall 1)	NSA 14

General

1. Type of project (new location, reconstruction, etc.):	widening and reconstruction
2. Total number of impacted receptor units in community	
Category A units impacted	
Category B units impacted	3
Category C units impacted	
Category D units impacted (if interior analysis required)	
Category E units impacted	

Warranted

1. Community Documentation	
a. Date community was permitted (for new developments or developments planned for or under construction)	pre-dates highway improvements
b. Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	Environmental Document awaiting approval

c. Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of *CE, ROD, or FONSI, as appropriate* ."

X Yes ____ No

2. Criteria requiring consideration of noise abatement (note N/A if category is not impacted or present or analysis not required). A "yes" answer to any of the following three questions requires the consideration of noise abatement.

a. With the proposed project, are design year noise levels predicted to approach or exceed the NAC level(s) in Table 1? X Yes ____ No

b. With the proposed project, is there predicted to be a substantial design year noise level increase of 10 dB(A) or more at Activity Category A, B, C, D, or E receptor(s)? ____ Yes X No

c. With the proposed project, are design year noise levels predicted to be less than existing noise levels, but still approach or exceed the NAC levels in Table 1 for the relevant Activity Category? ____ Yes X No

Feasibility – Questions 1c through 7 must all be answered "yes" for a noise barrier to be determined to be feasible.

1. Impacted receptor units		
a. Total number of impacted receptor units:	3	
b. Percentage of impacted receptor units receiving 5 dB(A) or more insertion loss:	100	
c. Is the percentage 50 or greater?	X Yes	No
2. Can the noise wall be designed and physically constructed at the proposed location?	X Yes	No
3. Can the noise wall be constructed without causing a safety problem?	X Yes	No
4. Can the noise wall be constructed without restricting access to vehicular or pedestrian travel?	X Yes	No
5. Can the noise wall be constructed in a manner that allows for access for required maintenance and inspection operations?	X Yes	No
6. Can the noise wall be constructed in a manner that permits utilities to function in a normal manner?	X Yes	No
7. Can the noise wall be constructed in a manner that permits drainage features to function in a normal manner?	X Yes	No

Reasonableness

1. Community Desires Related to the Barrier		
a. Do at least 50 percent of the responding benefited receptor unit owner(s) and renters desire the noise wall? If yes, continue with Reasonableness questions. If no, the noise wall can be considered not to be reasonable. Proceed to "Decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the benefited receptor unit owners do not desire the noise wall."	Yes	No
2. Square Footage Per Benefited Receptor (SF/BR) Evaluation		
a. Area (SF) of the proposed noise wall	14,400	
b. Number of benefited receptor units (any unit receiving 5 dB(A) or more insertion loss)	3	
c. SF/BR = 2a/2b	4,800	
d. Is 2c less than or equal to the MaxSF/BR value of 2000?	Yes	X No
3. Noise Reduction Design Goals (Activity Categories A, B, C, and E) A "yes" answer is required to Question 3a. for the noise wall to be determined to be reasonable. Questions 3b through 3e represent desirable goals that need not be met for a noise wall to be determined reasonable. However, they must be addressed and should be considered in the determination of the recommended noise wall.		
a. Does the noise wall reduce design year exterior noise levels by at least 7 dB(A) for at least one benefited receptor?	Yes	No

b. Does the noise wall provide an insertion loss of at least 7 dB(A) for more receptors than required under 3a.while still conforming to the MaxSF/BR value of 2,000 and a "point of diminishing returns" evaluation? _____ Yes _____ No

c. Does the noise wall provide insertion losses of greater than 7 dB(A) while still conforming to the MaxSF/BR value of 2,000 and a "point of diminishing returns" evaluation? _____ Yes _____ No

d. Does the noise wall reduce future exterior levels to the low-60-decibel range (60-63) for Category B and C receptors and the upper-60 dB(A) range (65-68) for Category E receptors? _____ Yes _____ No

e. Does the noise wall reduce design year noise levels back to existing levels? _____ Yes _____ No

4. Noise Reduction Design Goals (Activity Category D) A "yes" answer is required to Question 4a. for the barrier to be determined to be reasonable. Question 4b represents a desirable goal that need not be met for a noise wall to be determined reasonable. However, this goal must be addressed and should be considered in the determination of the recommended noise wall.

a. Does noise wall reduce design year interior noise levels by at least 7 dB(A) for the facility's analysis point? _____ Yes _____ No

b. While conforming to the MaxSF/BR criteria and justified by a "point of diminishing returns' evaluation, does the noise wall provide an interior insertion loss above the 7 dB(A) minimum _____ Yes _____ No

Decision

Is the Noise Wall WARRANTED? X Yes _____ No

Is the Noise Wall FEASIBLE? X Yes _____ No

Is the Noise Wall REASONABLE? _____ Yes X No

Additional Reasons for Decision:

Responsible/Qualified Individuals Making the Above Decisions

PennDOT, Engineering District Environmental Manager — Date

Alan J. Dunay, Acoustical Scientist, Skelly & Loy, Inc. — 5/1/2019

Qualified Professional Performing the Analysis (name, title, and company name) — Date

Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet – Noise Wall

Date	5/1/2019
Project Name	I-83 North York Widening
County	York County
SR, Section	I-83, Section 0083, Section 070
Community Name and/or NSA #	NSA 16
Noise Wall Identification (i.e., Wall 1)	NSA 16

General

1. Type of project (new location, reconstruction, etc.): widening and reconstruction

2. Total number of impacted receptor units in community

Category A units impacted	
Category B units impacted	13
Category C units impacted	
Category D units impacted (if interior analysis required)	
Category E units impacted	

Warranted

1. Community Documentation

a. Date community was permitted (for new developments or developments planned for or under construction): pre-dates highway improvements

b. Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI): Environmental Document awaiting approval

c. Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of *CE, ROD, or FONSI, as appropriate* ." X Yes ____ No

2. Criteria requiring consideration of noise abatement (note N/A if category is not impacted or present or analysis not required). A "yes" answer to any of the following three questions requires the consideration of noise abatement.

a. With the proposed project, are design year noise levels predicted to approach or exceed the NAC level(s) in Table 1? X Yes ____ No

b. With the proposed project, is there predicted to be a substantial design year noise level increase of 10 dB(A) or more at Activity Category A, B, C, D, or E receptor(s)? ____ Yes X No

c. With the proposed project, are design year noise levels predicted to be less than existing noise levels, but still approach or exceed the NAC levels in Table 1 for the relevant Activity Category? ____ Yes X No

Feasibility – Questions 1c through 7 must all be answered "yes" for a noise barrier to be determined to be feasible.

1. Impacted receptor units			
a. Total number of impacted receptor units:	13		
b. Percentage of impacted receptor units receiving 5 dB(A) or more insertion loss:	100		
c. Is the percentage 50 or greater?	X Yes		No
2. Can the noise wall be designed and physically constructed at the proposed location?	X Yes		No
3. Can the noise wall be constructed without causing a safety problem?	X Yes		No
4. Can the noise wall be constructed without restricting access to vehicular or pedestrian travel?	X Yes		No
5. Can the noise wall be constructed in a manner that allows for access for required maintenance and inspection operations?	X Yes		No
6. Can the noise wall be constructed in a manner that permits utilities to function in a normal manner?	X Yes		No
7. Can the noise wall be constructed in a manner that permits drainage features to function in a normal manner?	X Yes		No

Reasonableness

1. Community Desires Related to the Barrier			
a. Do at least 50 percent of the responding benefited receptor unit owner(s) and renters desire the noise wall? If yes, continue with Reasonableness questions. If no, the noise wall can be considered not to be reasonable. Proceed to "Decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the benefited receptor unit owners do not desire the noise wall."		Yes	No
2. Square Footage Per Benefited Receptor (SF/BR) Evaluation			
a. Area (SF) of the proposed noise wall	35,688		
b. Number of benefited receptor units (any unit receiving 5 dB(A) or more insertion loss)	24		
c. SF/BR = 2a/2b	1,487		
d. Is 2c less than or equal to the MaxSF/BR value of 2000?	X Yes		No
3. Noise Reduction Design Goals (Activity Categories A, B, C, and E) A "yes" answer is required to Question 3a. for the noise wall to be determined to be reasonable. Questions 3b through 3e represent desirable goals that need not be met for a noise wall to be determined reasonable. However, they must be addressed and should be considered in the determination of the recommended noise wall.			
a. Does the noise wall reduce design year exterior noise levels by at least 7 dB(A) for at least one benefited receptor?	X Yes		No

b. Does the noise wall provide an insertion loss of at least 7 dB(A) for more receptors than required under 3a.while still conforming to the MaxSF/BR value of 2,000 and a "point of diminishing returns" evaluation? X Yes ____ No

c. Does the noise wall provide insertion losses of greater than 7 dB(A) while still conforming to the MaxSF/BR value of 2,000 and a "point of diminishing returns" evaluation? X Yes ____ No

d. Does the noise wall reduce future exterior levels to the low-60-decibel range (60-63) for Category B and C receptors and the upper-60 dB(A) range (65-68) for Category E receptors? X Yes ____ No

e. Does the noise wall reduce design year noise levels back to existing levels? X Yes ____ No

4. Noise Reduction Design Goals (Activity Category D) A "yes" answer is required to Question 4a. for the barrier to be determined to be reasonable. Question 4b represents a desirable goal that need not be met for a noise wall to be determined reasonable. However, this goal must be addressed and should be considered in the determination of the recommended noise wall.

a. Does noise wall reduce design year interior noise levels by at least 7 dB(A) for the facility's analysis point? ____ Yes ____ No

b. While conforming to the MaxSF/BR criteria and justified by a "point of diminishing returns' evaluation, does the noise wall provide an interior insertion loss above the 7 dB(A) minimum ____ Yes ____ No

Decision

Is the Noise Wall WARRANTED? X Yes ____ No

Is the Noise Wall FEASIBLE? X Yes ____ No

Is the Noise Wall REASONABLE? X Yes ____ No

Additional Reasons for Decision:

Responsible/Qualified Individuals Making the Above Decisions

PennDOT, Engineering District Environmental Manager — Date

Alan J. Dunay, Acoustical Scientist, Skelly & Loy, Inc. — 5/1/2019

Qualified Professional Performing the Analysis (name, title, and company name) — Date

APPENDIX F -
TNM FILES (FTP LINK)

APPENDIX F TNM FILES

All TNM models created for the I-83 North York Widening project including 2018/2019 Validation, 2014 PM Peak Hour Existing Conditions and 2042 PM Peak Hour Design Build can be downloaded from:

http://www.skellyloy-gis.com/downloads/I-83 N York TNM files (rev 2019-05-20).zip

APPENDIX G -
S.R. 0181-017 NORTH GEORGE STREET/
EXIT 22 IMPROVEMENTS
PRELIMINARY DESIGN NOISE ANALYSIS

S.R. 0181-017 NORTH GEORGE STREET/EXIT 22 IMPROVEMENTS
PRELIMINARY DESIGN NOISE ANALYSIS

MANCHESTER TOWNSHIP
YORK COUNTY, PENNSYLVANIA

PREPARED FOR

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DISTRICT 8-0

PREPARED BY

AUGUST 2018
REVISION 2

S.R. 0181-017 NORTH GEORGE STREET/EXIT 22 IMPROVEMENTS
PRELIMINARY DESIGN NOISE ANALYSIS

MANCHESTER TOWNSHIP
YORK COUNTY, PENNSYLVANIA

PREPARED FOR

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
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2140 HERR STREET
HARRISBURG, PENNSYLVANIA 17103

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AUGUST 14, 2018
REVISION 2

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SKELLY AND LOY
ENGINEERING • ENVIRONMENTAL CONSULTANTS

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I. EXECUTIVE SUMMARY

I. EXECUTIVE SUMMARY

A preliminary design noise analysis was conducted for the S.R. 0181-017 North George Street/Exit 22 Improvements Project located in York County, Pennsylvania. The S.R. 0181-017 North George Street/Exit 22 Improvements Project extends from the existing I-83, Exit 22 interchange at the southern limit to the Locust Lane Overpass at the northern limit, encompassing approximately one mile within Manchester Township. The project consists of a new northbound on-ramp to the I-83 expressway from S.R. 0181. The purpose of this project is to improve roadway safety, reduce congestion, maintain mobility, and improve traffic operations of the I-83 interchange ramps and S.R. 0181. The noise analysis involved the measurement of existing noise levels, modeling of existing (2018) and design year (2042) noise conditions, noise impact assessment, and noise abatement evaluations within the project study area. Noise-sensitive land uses were identified and grouped into two unique Noise Study Areas (NSAs) to facilitate the analysis. Within these two NSAs, noise levels at 19 noise receptors (representing 72 equivalent residential units) were predicted and compared to the Federal Highway Administration (FHWA)/ Pennsylvania Department of Transportation (PennDOT) noise abatement criteria (NAC) to determine noise impacts.

Noise impacts for the design year (2042) conditions were identified within both NSAs. Noise mitigation within each of the NSAs was evaluated to determine feasibility and reasonableness. A noise barrier was determined to be both feasible and reasonable for NSA 2. Table I-1 presents a summary of the results of the barrier analyses.

A more detailed review will be completed during the final design of the project. As such, noise barriers that are found to be feasible and reasonable during the preliminary noise analysis may also not be found to be feasible and reasonable during the final design noise analysis. Conversely, noise barriers that were not considered feasible and reasonable may meet the established criteria and be recommended for construction.

TABLE I-1
NOISE BARRIER ANALYSIS SUMMARY

NOISE STUDY AREA	# OF NOISE IMPACTS	NOISE BARRIER LENGTH (FT)	AVERAGE NOISE BARRIER HEIGHT (FT)	NOISE BARRIER AREA (FT^2)	# OF BENEFITING RESIDENCES	SF/BR (FT^2 PER BENEFITED RESIDENCE)	FEASIBLE/ REASONABLE
1	8	NA	NA	NA	NA	NA	No / No
2	36	2,182	17	37,096	56	662	Yes / Yes

II. INTRODUCTION

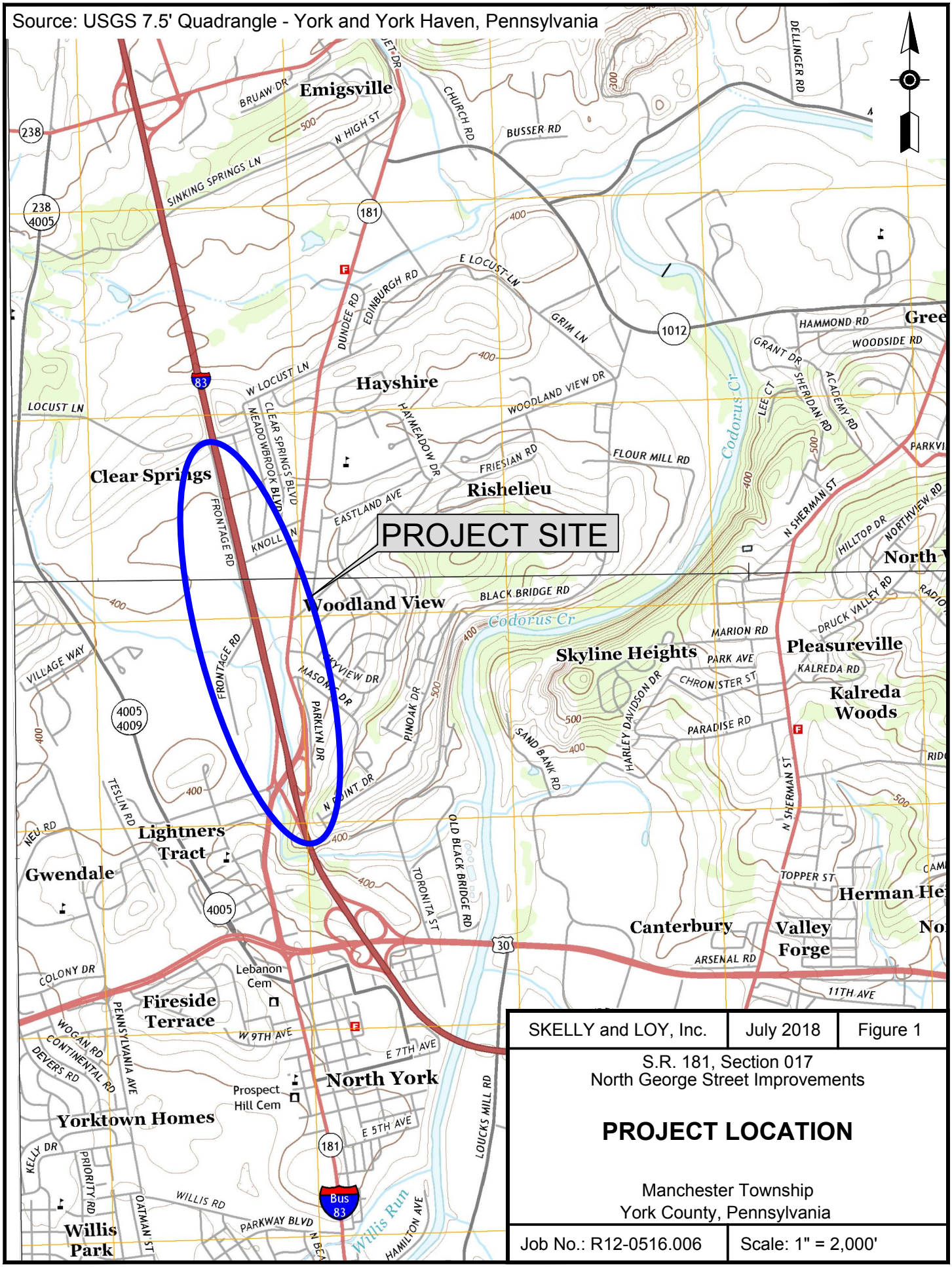
II. INTRODUCTION

A preliminary design noise analysis was conducted for the S.R. 0181-017 North George Street/Exit 22 Improvements Project located in York County, Pennsylvania. The S.R. 0181-017 North George Street/Exit 22 Improvements Project extends from the existing I-83, Exit 22 interchange at the southern limit to the Locust Lane Overpass at the northern limit, encompassing approximately one mile within Manchester Township. Figure 1 presents the location of the project study area.

The project consists of a new northbound on-ramp to the I-83 expressway from S.R. 0181. The purpose of the project is to improve roadway safety, reduce congestion, maintain mobility, and improve traffic operations of the I-83 interchange ramps and S.R. 0181.

The objective of this noise analysis is to assess the potential traffic noise impacts associated with the proposed ramp and to evaluate potential noise abatement measures wherever noise impacts are predicted to occur. This report presents a summary of the steps involved in the traffic noise analysis and includes a description of noise terminology, applicable standards and criteria, noise monitoring and modeling methodology, noise impact evaluation, mitigation evaluation, construction noise considerations, and information for local government officials.

All highway noise impact assessment procedures, noise abatement criteria, and documentation are in accordance with PennDOT's "Publication #24: Project Level Highway Traffic Noise Handbook," November 2015. PennDOT guidelines are based on the FHWA Federal Aid Policy Guide 23 CFR 772, U.S. Government Printing Office, updated July 13, 2011.



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III. FUNDAMENTALS OF SOUND AND METHODOLOGY

III. FUNDAMENTALS OF SOUND AND METHODOLOGY

A. FUNDAMENTALS OF SOUND

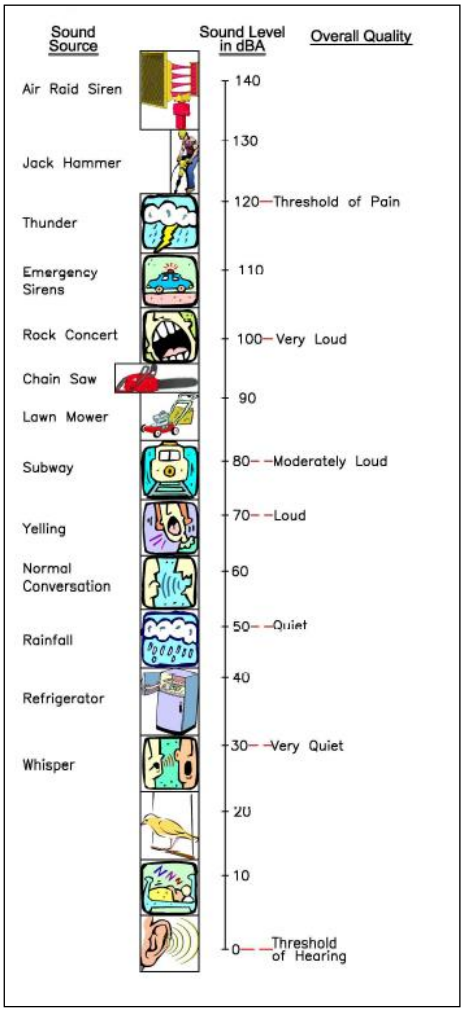
Sound is the vibration of air molecules in waves similar to ripples on water. When these vibrations reach our ears, we hear what we call sound. Noise is defined as "unwanted sound." Therefore, it can be considered a psychological phenomenon and not a physical one. The roar of racecars adds to the excitement of spectators and hence would be considered sound. This same roar may annoy nearby neighbors, thereby becoming noise. Factors playing a role in the perception of sound include magnitude, amplitude, duration, frequency, source, and receiver.

The intensity or loudness of sound is measured in units referred to as decibels (dB). Sound waves are created by the rapid movement of an object, and the rate at which the object moves back and forth is called its frequency, measured in hertz (Hz). While the human ear can detect sounds from about 20 to 20,000 Hz, it is more sensitive to frequencies between 500 and 4,000 Hz. To account for this occurrence, the A-weighted scale has been developed to place an emphasis on those frequencies which are more detectable to the human ear. The A-weighted scale, which has been in existence for over 40 years, is generally used in community and city noise ordinances and is expressed in units of dBA (decibels in the A-weighting). Researchers have established a correlation between the measurement of sound, the A-weighted decibel (dBA), and its associated perceived human response. Figure 2 represents this correlation of qualitative and quantitative descriptions. The A-weighted scale weighs the sound measurement unit of decibels to match the response of the human ear. It accounts for the fact that sounds of equal amplitude but different frequencies are not necessarily perceived to be equally loud.

Because sound is actually an energy level, it must be recorded on a logarithmic scale and expressed in logarithmic units called decibels (dB). Given this scale, a doubling of a noise source will result in a three-decibel increase in total level (i.e., 50 dBA + 50 dBA = 53 dBA, not 100 dBA). Typically, a change in sound level between 2 and 3 dBA is barely perceptible while a change of 5 dBA is readily noticeable by most people. A 10 dBA increase is usually perceived as a doubling of loudness and, conversely, noise is perceived to be reduced by one-half when a sound level is reduced by 10 dBA.

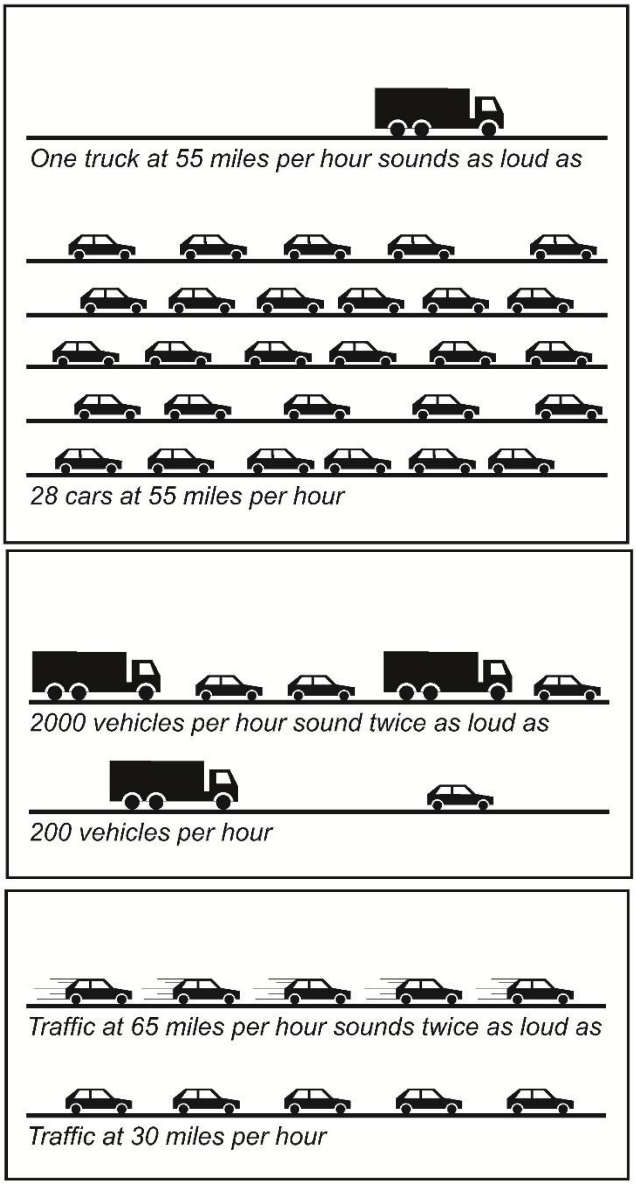
The principal noise sources of highway vehicles are the exhaust system, engine, and tires. Exhaust noise is typically controlled by mufflers, assuming that they are used and are functioning properly. Engine noise can be controlled only by vehicle manufacturers and proper maintenance, factors over which PennDOT has no control. Tire noise is generated by the interaction of each

FIGURE 2
COMMON SOUND LEVELS



vehicle's tires with the road surface. Engine and exhaust noise are usually louder than tire noise at vehicular speeds under 30 miles per hour. The reverse is normally true for vehicular speeds over 30 miles per hour. Highways are typically dominated by tire noise while local streets are typically dominated by engine and exhaust noise. The overall noise level generated by vehicles on a highway depends on the number of vehicles, the speed of the vehicles, and the types of vehicles. Figure 3 depicts generally how these factors influence noise levels.

FIGURE 3
TRAFFIC NOISE RELATIONSHIPS



B. METHODOLOGY

The first step of the preliminary design noise analysis is to assess the existing acoustical environment. Noise monitoring of existing conditions is the primary means of establishing background noise levels and propagation characteristics throughout the project area. The initial phase of the monitoring process is the identification and selection of noise-sensitive receptors. Sensitive receptors are defined as those land uses which are especially susceptible to noise

impacts. These may include hospitals, schools, residences, motels, hotels, recreational areas, parks, and places of worship. The sensitive receptors identified within the project study are considered Activity Categories B, C, E, and G as defined by the FHWA traffic noise regulations (23 CFR Part 772) and are summarized in Table III-1. This table provides a brief description of the various activity categories as well as the absolute federal/state noise criteria for each.

TABLE III-1
NOISE ABATEMENT CRITERIA
HOURLY A-WEIGHTED SOUND LEVEL IN DECIBELS (dBA)

ACTIVITY CATEGORY	Leq(h)[1]	DESCRIPTION OF ACTIVITY CATEGORY
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[2]	67(Exterior)	Residential
C[2]	67 (Exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E[2]	72 (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A, B, or C.
F	--	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	--	Undeveloped lands that are not permitted.

[1] Impact thresholds should not be used as design standards for noise abatement purposes.
[2] Includes undeveloped lands permitted for this activity category
Source: 23 CFR Part 772

Upon selection of noise-sensitive receptors, monitoring of the existing acoustical environment at these receptors is conducted. All monitoring for this project was performed using Metrosonics dB-3080 sound analyzers. Field calibration of the meters was performed immediately prior to noise monitoring using a Metrosonics cl-304 sound level calibrator. The sound analyzers were post-calibrated subsequent to the measurements using a Metrosonics cl-304 sound level calibrator. This equipment meets all requirements of the American National Standard Specification for Sound Level Meters, ANSI S1.4-1983 (R1990), Type 2.

Noise measurements were in the A-weighted scale and reported in decibels (dBA). The data collection procedure involved the Leq measurements in consecutive 30-second intervals. This method allows individual time intervals that include noise events unrelated to traffic noise (such as aircraft overflights) to be excluded from consideration. Hourly average noise levels [Leq(h)] were derived at each location from the 10-minute Leq values. Existing noise measurements were collected under meteorologically acceptable conditions when the pavement was dry and winds were calm or light. Additional data collected at each monitoring location included atmospheric conditions such as wind speed, humidity, and ambient temperature. Monitoring was conducted in accordance with the U.S. Department of Transportation, FHWA "Measurement of Highway-Related Noise," FHWA Report No. FHWA-PD-96-046, May 1996.

Traffic counts are also taken on roadways which significantly contribute to the overall noise levels during the monitoring period. Traffic is grouped into one of three categories: cars, medium trucks, and heavy trucks. Medium trucks are defined as vehicles having 2 axles and 6 wheels (between 4,500 Kg and 12,000 Kg). Heavy trucks are vehicles having 3 or more axles (greater than 12,000 Kg); cars are the remainder.

Upon completion of noise monitoring, a computer model of the existing roadway network and monitored receptors is constructed using data from digital topographical maps, highway design files, traffic volumes recorded in the field, and surveying (GPS) of existing terrain. Modeling of the project area is accomplished by applying the FHWA Traffic Noise Model (TNM) computer model, Version 2.5. This program is described in the U.S. Department of Transportation "FHWA Traffic Noise Model User's Guide," FHWA-PD-96-009, January 1998. The model has been established as a reliable tool for representing noise generated by highway traffic.

To represent the actual conditions, a numerical coordinate system of the roadway network and receivers is used. The TNM computer model uses a three-dimensional, Cartesian coordinate (X, Y, and Z) system to represent the roadways, terrain features, and receivers in the study area. Noise levels can then be predicted for various scenarios of traffic flow, geometrics, and topography. In addition to the definition of physical features within the coordinate geometry system, traffic volumes and speeds for each of the three vehicle types are entered into the model as two other categories of input variables.

The modeling process continues with model validation in accordance with PennDOT procedures. This is performed by comparing the monitored noise levels with noise levels generated by the computer model, using the traffic volumes and speeds that were collected during the monitoring process. This comparison ensures that reported changes in noise levels between future and existing conditions are due to changes in conditions and do not erroneously reflect

discrepancies between the modeling and monitoring techniques. A difference between the monitored and modeled levels of three decibels or less is considered acceptable (this is the limit of change detectable by typical human hearing) and is used by PennDOT as the calibration benchmark. Following validation of the existing conditions models, additional modeling sites are added to thoroughly predict existing noise levels throughout the project and to determine the baseline sound-level data at these modeling sites where no field measurements were made.

The next step in the noise analysis is to project future, design year noise levels with the proposed alignment in place and determine if the future levels will approach or exceed the noise abatement criteria (NAC). If the criteria are approached or exceeded at any receptor (or residence represented by that receptor), abatement considerations are warranted to attempt to provide a substantial noise reduction at the noise-impacted receptor. The future design model is created by adding the roadway design into the existing conditions model. Projected design year traffic volumes, compositions, and speeds are assigned to all roadways, and future noise levels are predicted.

After future noise levels have been predicted, mitigation analysis is performed. The three steps of mitigation analysis are determining where noise abatement consideration is warranted, determining if noise abatement is feasible, and determining if noise abatement is reasonable. Abatement consideration is warranted where future noise levels have been predicted to exceed the NAC. Federal procedures require the state to specify the level which "approaches" the criteria. PennDOT defines approaching as within 1 dBA of the NAC. In addition, federal procedures stipulate that abatement considerations are required if the project results in a "substantial noise increase" above existing conditions. PennDOT regulations state that if a future predicted noise level at any given receptor approaches or exceeds the appropriate abatement criterion or if future predicted traffic noise levels substantially exceed the existing noise levels by 10 dBA or greater, abatement considerations are required.

After identifying areas where abatement consideration is warranted, the feasibility of potential mitigation is then analyzed. Feasibility deals with engineering considerations; specifically, can a substantial noise reduction be achieved given the conditions of a specific location. Feasibility questions include:

1) Can a noise reduction of at least 5 dBA be achieved at the majority of impacted receptors?

2) Can a noise barrier be designed and physically constructed at the proposed location?

3) Can the noise barrier be constructed without causing safety issues or restrict vehicular/pedestrian access?

4) Can the noise barrier be constructed in a manner that allows maintenance access and utilities and drainage to adequately function.

If the proposed mitigation scenario (typically vertical concrete barriers or earth berms) can satisfy these requirements, the mitigation is considered feasible.

If mitigation has been determined to be feasible, the reasonableness of the mitigation is analyzed. Reasonableness is a more subjective criterion than feasibility. This determination takes into account the cost-effectiveness of the mitigation, acoustic performance, and the desires of individuals impacted by highway traffic noise. If the majority of benefiting residents and property owners do not want the noise barrier, it is not considered to be reasonable. If the abatement effectiveness is less than 2,000 square feet (ft^2) per benefited receptor (BR), it is considered reasonable (pending public input). In addition, the majority of benefited receptors need to obtain a 5 dBA reduction, with at least one receptor receiving a 7 dBA reduction. Other optional factors are considered during the reasonableness phase although, singly, these factors cannot eliminate an abatement measure.

Following is a discussion of the existing conditions, predicted future conditions, and mitigation alternatives and recommendations.

IV. EXISTING NOISE ENVIRONMENT

IV. EXISTING NOISE ENVIRONMENT

A. SHORT-TERM NOISE MONITORING

Short-term noise monitoring is not a process to determine design year noise impacts or barrier locations. Short-term noise monitoring provides a level of consistency between what is present in real-world situations and how that is represented in the computer noise model. Short-term monitoring does not need to occur within every NSA to validate the computer noise model.

One short-term noise measurement of ten minutes in duration was obtained during off-peak traffic hours on May 8, 2018. A summary of the short-term noise monitoring results is presented in Table IV-1.

TABLE IV-1
SHORT-TERM NOISE MONITORING SUMMARY

NSA	SITE ID	SITE DESCRIPTION	MEASURED SOUND LEVEL (dBA)	MEASUREMENT TIME	MEASUREMENT DATE
2	A	150 Knoll Ln	76	12:58:00 - 13:08:00	5/8/2018

The location of the noise monitoring site is presented on Figure 4. Additional noise monitoring data (site sketch, meter printout, and calibration certificate) are located in Appendices A through C. The measured sound level in the study corridor was 76 dBA. Traffic noise from I-83 was the dominant source of noise at the monitoring location.

B. NOISE MODEL VALIDATION

Noise monitoring data are primarily utilized to validate the computer model used to predict existing and future levels. Upon measurement of the existing noise levels, a three-dimensional noise model of the existing roadway network was constructed which incorporates all significant terrain features that define the propagation path between the roadway and noise-sensitive receptors. Traffic volumes, composition, and speeds observed during the short-term monitoring periods were used as inputs to generate the validation models sound levels. A difference of ±3 dBA or less between the measured noise levels and the computer modeled noise levels is considered acceptable, as this is the limit of change detectable by the typical human ear. This computer model validation verifies that the sound propagation paths within the model are accurate

and that the modeling techniques are correct and ensures that reported changes between the existing and future design year conditions are due to changes in traffic or propagation path as opposed to discrepancies between monitoring and modeling techniques.

The model validation was performed for the existing traffic conditions observed and recorded during the measurement period. As these noise measurements were not necessarily obtained during the existing loudest hour, the existing noise levels obtained during the ten-minute short-term monitoring session were not reported as the project's existing noise levels. Instead, the validated existing conditions TNM noise model was used to generate existing loudest-hour noise levels by using Peak Hour Volumes and truck percentages supplied by traffic engineers as model inputs.

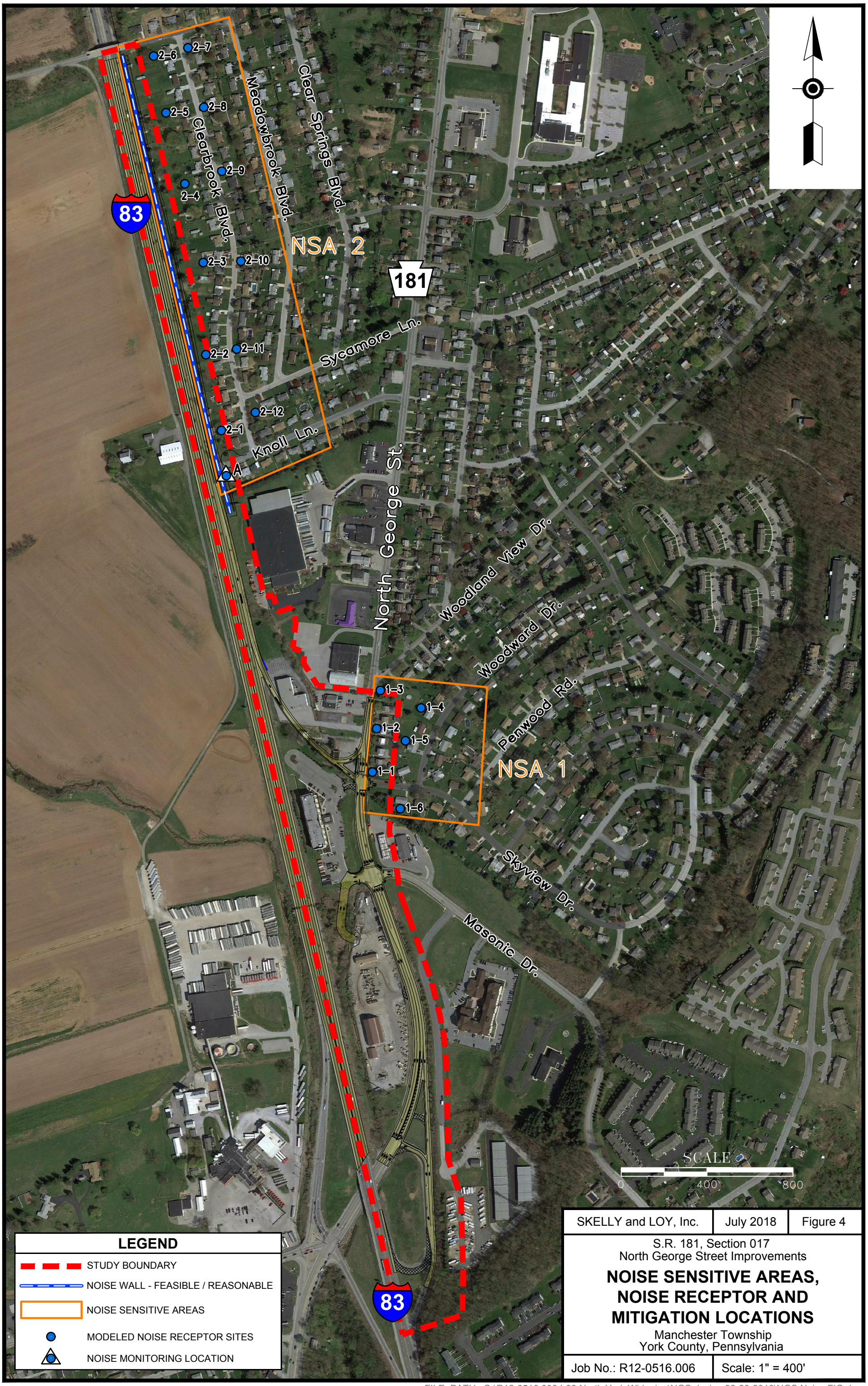
A summary of the model validation is presented in Table IV-2. The monitored location was able to be accurately modeled within the acceptable ±3 dBA range. For the majority of the modeling locations, propagation paths were non-complex with relatively simple terrain features. Due to the relatively close proximity of the monitoring locations to I-83 and absence of other major noise sources, traffic noise was the most dominant component of the acoustic environment at the monitoring location.

TABLE IV-2
NOISE MODEL VALIDATION

NSA	SITE ID	MEASURED NOISE LEVEL (dBA)	CALCULATED NOISE LEVEL (dBA)	DIFFERENCE (dBA)
2	A	75.9	75.4	-0.5

C. NOISE STUDY AREA DETERMINATION

A noise study area (NSA) is defined as a group of receptors that are exposed to similar noise sources and levels; traffic volumes, traffic mix, and speed; and topographic features. There are two distinct geographic areas within the project area containing noise-sensitive land uses that can be considered similar in acoustical environment. Figure 4 represents each of the NSAs within the project area.



SKELLY and LOY, Inc.	July 2018	Figure 4

S.R. 181, Section 017
North George Street Improvements

NOISE SENSITIVE AREAS, NOISE RECEPTOR AND MITIGATION LOCATIONS

Manchester Township
York County, Pennsylvania

Job No.: R12-0516.006	Scale: 1" = 400'

FILE PATH : Q:\R12-0516.006 I-83 North York Widening\NGS design 02-28-2018\NGS Noise FIG.dwg

D. TRAFFIC DATA FOR NOISE PREDICTION

For calculation of the existing loudest-hour noise levels within each NSA, additional noise receptor locations are modeled to provide a comprehensive basis of comparison for the analysis of noise impacts from the existing and future project conditions. Using the appropriate loudest-hour traffic data, existing and future traffic noise levels were predicted for the measurement sites and the additional receptor locations.

The traffic data used in the noise analysis must produce sound levels representative of the loudest hour of the day in the future design year. Traffic data were supplied by Whitman, Requardt & Associates as A.M. Peak Hour and P.M. Peak Hour volumes for both the Existing (2018) and the Design Year (2042) for all major roadways in the local network. Truck percentages and speed limits were provided for each roadway in the local network.

A comparison of the two different peak hour traffic data determined that overall traffic volumes for the mainline of I-83 were similar for both the A.M. and P.M. Peak Hour volumes. As the variations between A.M. Peak Hour and P.M. Peak Hour volumes are negligible regarding noise level prediction and impact determination, the A.M. Peak Hour volumes were chosen for the analysis.

E. EXISTING CONDITIONS

The discussion of existing conditions that follows, as well as the design year impact determination and mitigation consideration in the following section, will be discussed for each NSA.

1. NSA 1

NSA 1 is located immediately east of the future I-83 northbound ramp from PA 181. It is comprised of 16 single-family residences located along PA 181 (North George Street), Skyview Drive, and Woodward Drive. Existing traffic noise levels currently exceed the FHWA/PennDOT NAC of 66 dBA for the homes that abut PA 181, ranging between 56 and 67 dBA. A combination of traffic noise from I-83 and North George Street contribute to the existing acoustic environment within NSA 1.

2. NSA 2

NSA 2 extends from Knoll Lane northward along Clearbrook Boulevard and ends at Locust Lane. This area directly abuts I-83 and the proposed north bound on-ramp from PA 181. It is comprised of 50 single-family residences along Clearbrook Boulevard and 6 single-family homes at the end of Knoll Lane. These homes are situated at the same grade as the I-83 profile, and the backyards are located approximately 10 to 20 feet from the edge of the shoulder. The residential structures are 100 feet from the right-of-way at the southern end of Clearbrook Boulevard and 200 feet from I-83 at the northern limit. A traffic noise level of 76 dBA was measured within NSA 2. Traffic noise levels currently exceed the FHWA/PennDOT NAC of 66 dBA, with existing traffic noise levels modeled between 61 and 76 dBA. Traffic noise from I-83 dominates the existing acoustic environment within NSA 2.

V. DESIGN YEAR NOISE IMPACTS

V. DESIGN YEAR NOISE IMPACTS

The future design year model was constructed based on preliminary design engineering plans and projected design year (2042) traffic figures. The project consists of a new on ramp and associated acceleration lane from PA 181 (North George Street) to northbound I-83.

Along with the proposed roadway improvement designs, future terrain features were incorporated into this model to ensure the most accurate noise propagation paths possible. Predicted noise levels for both the existing year and the 2042 build scenario are presented in Table V-1. Impact determination for the design year is discussed below for each NSA.

TABLE V-1
DESIGN YEAR NOISE LEVELS [$L_{eq(h)}$ IN dBA]

NOISE STUDY AREA	RECEPTOR ID	NUMBER OF RESIDENTIAL UNITS	ACTIVITY CATEGORY	NOISE ABATEMENT CRITERIA (dBA)	2018 A.M. PEAK HOUR MODELED NOISE LEVEL	2042 A.M. PEAK HOUR MODELED NOISE LEVEL
NSA 1	1-01	3	B	66	**66**	**70**
	1-02	3	B	66	**66**	**69**
	1-03	2	B	66	**67**	**69**
	1-04	3	B	66	56	58
	1-05	2	B	66	57	60
	1-06	3	B	66	60	63
NSA 2	A	3	B	66	**76**	**77**
	2-01	5	B	66	**70**	**75**
	2-02	5	B	66	**73**	**75**
	2-03	5	B	66	**69**	**70**
	2-04	5	B	66	**69**	**70**
	2-05	5	B	66	**69**	**71**
	2-06	4	C	66	**68**	**69**
	2-07	4	B	66	61	62
	2-08	4	B	66	62	63
	2-09	5	B	66	63	64
	2-10	5	B	66	63	65
	2-11	4	B	66	65	**66**
	2-12	2	B	66	63	65

Red shade denotes impacted sound level

A. NSA 1

Design year (2042) traffic noise levels at 8 of the 16 residential units within NSA 1 (represented by Receptors 1-01, 1-02, and 1-03) are predicted to approach or exceed the FHWA/PennDOT NAC of 66 dBA. An average increase of 2 to 4 dBA is predicted for the majority of the residences within NSA 1. This increase in future traffic noise levels can be attributed to an increase in traffic along I-83, PA 181, as well as some contribution from the addition of the new Exit 22 on-ramp to I-83. Future traffic noise levels within NSA 1 are predicted to range between 58 and 71 dBA. Noise abatement consideration is warranted for NSA 1.

B. NSA 2

Design year (2042) traffic noise levels at 36 of the 56 residential units within NSA 2 (represented by Receptors 2-01 through 2-06, Receptor 2-11, and Monitoring Site A) are predicted to approach or exceed the FHWA/PennDOT NAC of 66 dBA. An average increase of 1 to 5 dBA is predicted for the majority of the residences within NSA 2. This increase in future traffic noise levels can be attributed to an increase in traffic along I-83 as well as the addition of acceleration noise associated with the proposed on-ramp. Future traffic noise levels within NSA 2 are predicted to range between 69 and 77 dBA for the front row of houses. Noise abatement consideration is warranted for NSA 2.

VI. MITIGATION ALTERNATIVES AND CONSIDERATION

VI. MITIGATION ALTERNATIVES AND CONSIDERATION

Based on the impact evaluation discussed in the preceding section, noise abatement consideration is warranted for NSAs 1 and 2. This section of the document outlines the preliminary abatement alternatives which were considered in an attempt to reduce noise levels at the receptors which warrant abatement considerations.

State and federal guidelines suggest a range of mitigation measures which should be considered. Although noise barriers or berms are the most common response to an identified impact, other approaches can be effective under certain circumstances. Traffic-control measures (e.g., speed restrictions, prohibitions for certain vehicle types during certain periods of the day), alteration of horizontal or vertical alignments, acquisition of land as a buffer, and soundproofing of public use or nonprofit institutional structures have been suggested as alternative abatement measures. Due to the nature of the I-83 corridor, these alternative abatement considerations are not feasible or practical. Traffic-control measures are not practical due to the high volume of vehicles using this roadway. Alignment modifications are not feasible due to right-of-way constraints, nor is the acquisition of land to act as a buffer since noise-sensitive land uses are located adjacent to the highway and therefore land to act as a buffer does not exist. The impacts have been predicted to largely affect private residences; therefore, soundproofing is not supported by the Department. Furthermore, soundproofing would not improve exterior conditions, so outdoor uses would not benefit.

For the S.R. 0181-017 North George Street/Exit 22 Improvements Project, noise barriers are the only practical method to reduce highway traffic noise levels. Noise barriers were evaluated to determine feasibility and reasonableness for the two NSAs warranting noise abatement consideration. Noise barriers were determined to be both feasible and reasonable for NSA 2. Due to property access requirements, placement of a noise barrier was not feasible for NSA 1. Table VI-1 presents a summary of the results of the barrier analyses. Individual discussions for

TABLE VI-1
NOISE BARRIER ANALYSIS SUMMARY

NOISE STUDY AREA	# OF NOISE IMPACTS	NOISE BARRIER LENGTH (FT)	AVERAGE NOISE BARRIER HEIGHT (FT)	NOISE BARRIER AREA (FT^2)	# OF BENEFITING RESIDENCES	SF/BR (FT^2 PER BENEFITED RESIDENCE)	FEASIBLE/ REASONABLE
1	8	NA	NA	NA	NA	NA	No / No
2	36	2,182	17	37,096	56	662	Yes / Yes

each NSA warranting noise abatement consideration follow. All noise levels presented in Table VI-2 have been rounded to the nearest whole number. Insertion losses were calculated prior to rounding which results in minor discrepancies. Locations of all evaluated noise barriers are presented on Figure 4.

A. NSA 1

While these receptors are impacted and mitigation consideration is warranted, the residences access their property via driveway directly off of North George Street. Placing a noise barrier would prohibit access to the property; therefore, noise mitigation is not feasible and is not recommended for further analysis and consideration during Final Design.

B. NSA 2

A noise barrier was evaluated between the I-83 northbound lanes and the adjacent noise-impacted land uses of NSA 2 to determine noise abatement feasibility and reasonableness. The southern end of the barrier starts near Station 895+25 and continues parallel to the northbound lanes, terminating at the north at Station 917+00 (Locust Lane overpass). Multiple barrier heights were analyzed in attempt to meet the barrier design goals specified by PennDOT. Appendix B contains data for the barrier height analysis. The noise barrier design was optimized to yield the maximum amount of noise reduction before reaching a point of diminishing returns while still conforming to the MaxSF/BR criteria. This optimized wall is 2,182 feet in length, averages 17 feet in height, and has a total area of 37,096 ft^2. This optimized design obtains a noise reduction of ≥5 dBA at all 36 noise-impacted residential units (see Table VI-3). The noise reduction at the impacted sites ranges from 8 to 12 dBA. The barrier also provides ≥5 dBA noise reduction at 20 non-impacted residences. This noise barrier benefits a total of 56 residential units, equating to 662 ft^2/benefitted receptor (BR), significantly less than the 2,000 ft^2/BR reasonableness threshold specified by PennDOT guidance.

The most severely impacted receptor obtains a 12 dBA insertion loss, with final abated levels for the NSA in the low 60-decibel range and below. This proposed noise barrier fulfills both the feasible and reasonable criteria and is recommended for further analysis and consideration during Final Design.

TABLE VI-2
NSA 2 NOISE BARRIER DATA

NOISE STUDY AREA	RECEPTOR ID	RESIDENTIAL UNITS REPRESENTED	2042 BUILD SOUND LEVEL (WITHOUT BARRIER) (dBA)	2042 BUILD SOUND LEVEL (WITH BARRIER) (dBA)	INSERTION LOSS FROM OPTIMIZED BARRIER (dBA)
NSA 2	A	3	**77**	65	12
	2-01	5	**75**	64	11
	2-02	5	**75**	63	12
	2-03	5	**70**	60	10
	2-04	5	**70**	60	10
	2-05	5	**71**	61	10
	2-06	4	**69**	61	8
	2-07	4	62	56	6
	2-08	4	63	57	7
	2-09	5	64	58	6
	2-10	5	65	58	6
	2-11	4	**66**	58	8
	2-12	2	65	58	7

66 Red highlighted values exceed the noise impact threshold of 66 dBA

AVERAGE HEIGHT (FT)	LENGTH (FT)	SQUARE FEET	TOTAL BENEFITS	SQUARE FEET/ BENEFITS	FEASIBLE? / REASONABLE?
17	2,182	37,096	56	662	YES / YES

VII. CONSTRUCTION NOISE

VII. CONSTRUCTION NOISE

Throughout the construction phase of the S.R. 181-017 North George Street/Exit 22 Improvements Project, noise-sensitive land uses that are analyzed for traffic noise impacts are also susceptible to construction noise impacts. Typical highway construction/reconstruction equipment (such as loaders, dump trucks, graders, bulldozers, etc.) are likely to temporarily elevate noise within the project area. Sensitive receptors within 100 to 200 feet of construction activities may experience varying periods and degrees of noise impact, with potential noise levels between 75 and 85 dBA, depending on the nature of the construction activity, the type of equipment in use, and the relative proximity to the activity.

Construction noise can be minimized by implementing specific measures to help mitigate the noise at the source. The contractor shall exercise proper maintenance procedures for all construction equipment regularly and thoroughly. Replacement of failing or ineffective muffling and exhaust systems, periodic lubrication of moving parts, and properly tuned engines are necessary in order to keep construction equipment noise emissions to a minimum.

Low-cost, easy-to-implement measures should be incorporated into project plans and specifications (e.g., work-hour limits, elimination of “tailgate banging,” reduction of backing up for equipment with alarms, complaint mechanisms). Additionally, several other specific mitigation procedures can be incorporated to help to minimize construction noise impacts. Temporary noise barriers, varying the areas of construction activity, community input regarding the sequence of operations, and financial incentives for the contractor to keep construction noise levels at a minimum are all things to be considered in order to reduce the severity of construction noise impacts during the construction phase.

Prior to any construction activity, a construction noise mitigation plan will be required to be approved by PennDOT and implemented by the construction contractor.

VIII. LOCAL OFFICIALS/PUBLIC INVOLVEMENT

VIII. LOCAL OFFICIALS/PUBLIC INVOLVEMENT

FHWA and PennDOT policies require that PennDOT provide certain information to local officials within whose jurisdiction the highway project is located in order to minimize future traffic noise impacts of Type I projects on currently undeveloped lands. (Type I projects involve highway improvements with noise analysis.) This must include information on noise-compatible land use planning, noise impact zones in undeveloped land in the highway project corridor, and federal participation in Type II projects (noise abatement only). This section of the report provides that information as well as information about PennDOT's noise abatement program. PennDOT's current noise policy outlines PennDOT's approach to communication with local officials and provides information and resources on highway noise and noise-compatible land use planning. PennDOT's intention is to assist local officials in planning the uses of undeveloped land adjacent to highways to minimize potential impacts of highway traffic noise.

"Entering the Quiet Zone" is a brochure that provides general information and examples to elected officials, planners, developers, and the general public about the problem of traffic noise and effective responses to it. The following is a link to this brochure on FHWA's website: http://www.fhwa.dot.gov/environment/noise/noise_compatible_planning/federal_approach/land_use/qz00.cfm.

A wide variety of administrative strategies may be used to minimize or eliminate potential highway noise impacts, thereby preventing the need or desire for costly noise abatement structures (such as noise barriers) in future years. There are five broad categories of such strategies:

- zoning,
- other legal restrictions (subdivision control, building codes, health codes),
- municipal ownership or control of the land,
- financial incentives for compatible development, and
- educational and advisory services.

"The Audible Landscape: A Manual for Highway and Land Use" is a well-written and comprehensive guide addressing these noise-compatible land use planning strategies, with significant detailed information. This document is available through FHWA's website, at http://www.fhwa.dot.gov/environment/noise/noise_compatible_planning/federal_approach/audible_landscape/al00.cfm.

Finally, public meetings and/or workshops are an appropriate forum to discuss and present the findings of the environmental studies to the public. During the Final Design phase of the project, specific public meetings will be organized with communities where noise abatement is considered warranted, feasible, and reasonable in accordance with PennDOT's three-phased approach. The information and conclusions contained in the Final Design Noise Analysis report will be discussed with the neighborhoods (after FHWA approval of the report), and the results of the meetings will be documented in the final version of the Final Design Noise Analysis document.

IX. CONCLUSION

IX. CONCLUSION

A preliminary design noise analysis was conducted for the S.R. 0181-017 North George Street/Exit 22 Improvements Project located in York County, Pennsylvania. The noise analysis involved the measurement of existing noise levels, modeling of existing (2018) and design year (2042) noise conditions, design year noise impact assessment, and noise abatement evaluations within the project study area.

Noise impacts for the design year conditions were identified within both NSAs in the project area. Noise barriers to reduce elevated traffic noise levels within these NSAs were evaluated to determine feasibility and reasonableness. A noise barrier was determined to be both feasible and reasonable for NSA 2.

A more detailed review will be completed during Final Design of the project. As such, noise barriers that are found to be feasible and reasonable during the preliminary noise analysis may also not be found to be feasible and reasonable during the final design noise analysis. Conversely, noise barriers that were not considered feasible and reasonable may meet the established criteria and be recommended for construction.

X. LIST OF PREPARERS AND REVIEWERS

X. LIST OF PREPARERS AND REVIEWERS

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XI. APPENDICES

APPENDIX A -
SITE SKETCHES, NOISE METER AND CALIBRATOR CALIBRATION CERTIFICATES, AND NOISE METER PRINTOUTS

Route 28 Widening Noise Monitoring Site Sketch
Short-term Ambient Monitoring

Site # TMS 1-1 Description: 150 Knoll Ln

MONITORING INFORMATION

Notes:

Date: 5/8/2018
Start Time: 12:58:00
End Time: 13:08:00
Meter ID: db-3080 SN 3895
Response Rate: slow
Roadway: I-83 NB / SB
Cars: 182/220
MT: 16/29
HT: 45/33

Time	Lav (dBA)		
12:58:00	75.7		
12:58:30	69.3		
12:59:00	76.3		
12:59:30	79.2		
13:00:00	76.3		
13:00:30	75.9		
13:01:00	76.3		
13:01:30	75.5		
13:02:00	74.5		
13:02:30	74.2		
13:03:00	74.7		
13:03:30	75.6		
13:04:00	77.9		
13:04:30	77.9		
13:05:00	73.3		
13:05:30	75.2		
13:06:00	77.0		
13:06:30	75.4		
13:07:00	75.0		
13:07:30	75.6		

Leq (dBA)
75.9

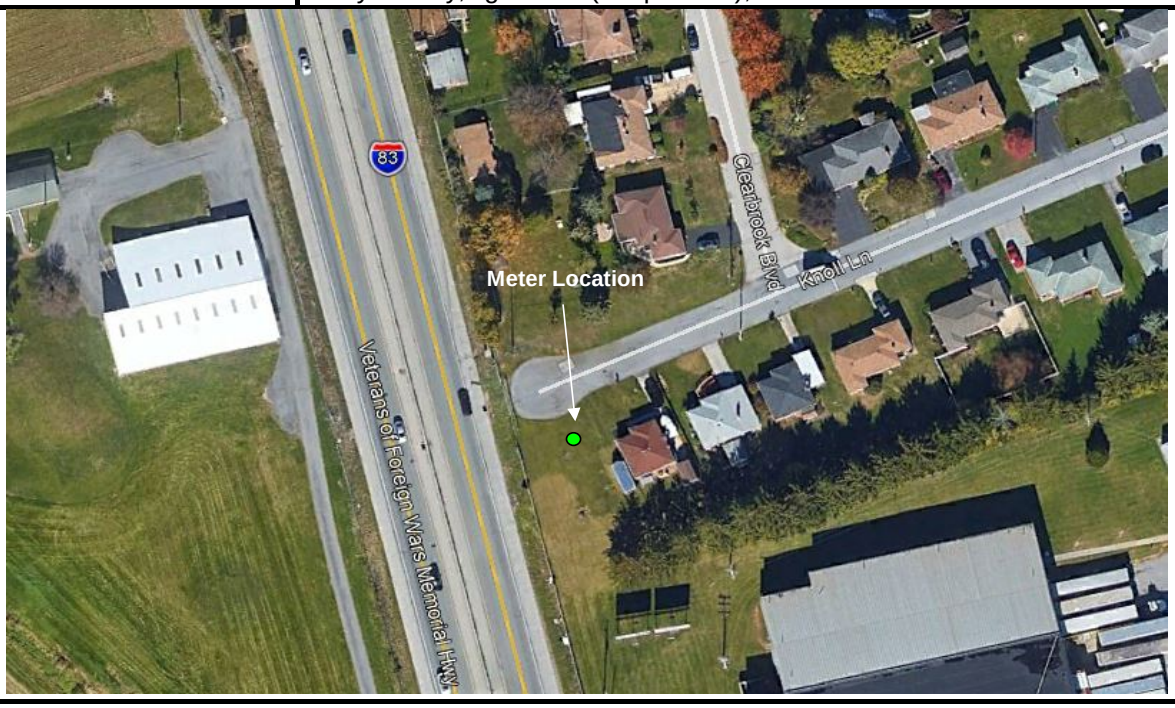
SITE SKETCH:

North Arrow

Site Specifics

Pavement Type:	Grade:	Site Surface:	Employee:
Asphalt	At Grade	soft	ERZ

Atmospheric Conditions :
Partly Cloudy, light wind (1 mph wind), 67° F



West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

PERMISSIBLE SOUND LEVEL METER

Manufactured by:	**METROSONICS**
Model No:	**db3080**
Serial No:	**3895**
Calibration Recall No:	**28756**

Submitted By:

Customer:	**EVAN R. ZEIDERS**
Company:	**SKELLY & LOY, INC.**
Address:	**449 EISENHOWER BLVD., STE. 300**
	HARRISBURG PA 17111

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. db3080 METR

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.
The information supplied relates to the calibrated item listed above.
West Caldwell Calibration Laboratories' calibration control system meets the requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2008 and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by: FC

Calibration Date: 26-Apr-18

Felix Christopher (QA Mgr.)

Certificate No: 28756 - 1

ISO/IEC 17025:2005

ACCREDITED

Calibration Lab. Cert. # 1533.01

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

West Caldwell Calibration Laboratories Inc.

1575 State Route 96, Victor NY 14564
Tel. (585) 586-3900 FAX (585) 586-4327

Calibration Data Record

for

Manufacturer: Metrosonics

Permissible Sound Level Meter Model No.: db-3080 S/N: 3895

Submitted by, Company: Skelly & Loy, Inc.

Test	Function	Tolerance Min	Tolerance Max		Measured values Before	Out	After	Out
,0.	SPL Reading with 102.0dB SPL	101.4	102.6		102.0		102.0	
,1.	Level Accuracy	93.4	94.6	94dB	94.0		94.0	
		103.4	104.6	104dB	104.0		104.0	
		113.4	114.6	114dB	114.0		114.0	
,2.	Frequency Response	88.0	97.8	8kHz	93.6		93.6	
	A Weighting	92.1	97.9	4kHz	94.9		94.9	
		93.3	97.1	2kHz	95.6		95.6	
		92.6	95.4	1kHz	94.0		94.0	
		89.4	92.2	500Hz	91.4		91.4	
		84.0	86.8	250Hz	85.3		85.3	
		76.5	79.3	125Hz	77.6		77.6	
		65.9	69.7	63Hz	67.6		67.6	
		51.8	57.5	31.5Hz	54.0		54.0	
	C Weighting	86.1	95.9	8kHz	92.0		92.0	
		90.3	96.1	4kHz	93.2		93.2	
		91.9	95.7	2kHz	94.4		94.4	
		92.6	95.4	1kHz	94.0		94.0	
		92.6	95.4	500Hz	94.0		94.0	
		92.6	95.4	250Hz	94.0		94.0	
		92.4	95.2	125Hz	94.0		94.0	
		91.3	95.1	63Hz	93.1		93.1	
		88.2	93.9	31.5Hz	89.6		89.6	
,3								
	SLM	113.4	114.6		114.0		114.0	
	L avg. / Leq	113.4	114.6		114.0		114.0	
	L max.	113.4	114.6		114.2		114.2	
	L pk	116.1	117.9		116.8		116.8	
	Dose %							
	0.18% @ 94 dB 1kHz	0.14%	0.22%		0.17%		0.17%	
	0.73% @ 104 dB 1kHz	0.58%	0.88%		0.78%		0.78%	
	2.90% @ 114 dB 1kHz	2.32%	3.48%		2.93%		2.93%	
4	Inherent noise level				62.4		62.4	

The expanded uncertainty of calibration at 95% confidence level with a coverage factor of k=2.

Parameter	Test Instrumentation Uncertainty	DUT Uncertainty	Total DUT Uncertainty
Reading with mic. @ 1 kHz:	0.11	0.1	0.15
Meter linearity:	0.17	0.1	0.20
Attenuator accuracy:	0.17	0.1	0.20
Freq. Response: 63 Hz to 8 kHz	0.10	0.1	0.14
Inherent noise level:	0.024	0.1	0.10
Functions:	0.11	0.1	0.15
Sensitivity:	0.11	0.1	0.15
Dose:	0.30	0.1	0.32

Measurements performed by:

Calibration Date: 26-Apr-2018

James Zhu

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor NY 14564

ISO/IEC 17025: 2005
ACCREDITED
Calibration Lab. Cert. # 1533.01

REPORT OF CALIBRATION

for

Metrosonics Permissible Sound Level Meter

Model No.: db3080 **Serial No.: 3895**
Company: Skelly & Loy, Inc. **I. D. No.: XXXX**

Calibration results:
Before data: ..... **After data:** .....
Before & after data same: ...X...

All tested parameters: Pass

For details see "Calibration Data Record"

Laboratory Environment:		
Ambient Temperature:	**20.2**	°C
Ambient Humidity:	**32.6**	% RH
Ambient Pressure:	**98.624**	kPa
Calibration Date:	**26-Apr-2018**	
Calibration Due:	**26-Apr-2019**	
Report Number:	**28756 -1**	
Control Number:	**28756**	

The above listed instrument meets or exceeds the tested manufacturer's specifications.
This Calibration is traceable through NIST test numbers listed below.
The absolute uncertainty of calibration: See last page. Unless otherwise noted, the reported values are both "as found" and "as left" data.

The above listed instrument was checked using calibration procedure documented in West Caldwell Calibration Laboratories Inc. procedure : **Rev. 7.0 Jan. 24, 2014 Doc. # 1038 DB3080METR**
Calibration was performed by West Caldwell Calibration Laboratories Inc. under Operating Procedures intended to implement the requirements of ISO10012-1, IEC Guide 25, ANSI/NCSL Z540-1, (MIL-STD-45662A) and ISO 9001:2008, ISO 17025

NIST Traceable Instruments:			Date of Cal.	Traceability No.	Re-cal. Due Date
Brüel & Kjær	4226	S/N 2272364	1-Aug-2017	822/275722-15	1-Aug-2018

Cal. Date: 26-Apr-2018
Calibrated on WCCL system type 9700

Measurements performed by: .....
James Zhu

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

ACOUSTICAL CALIBRATOR

Manufactured by:	METROSONICS
Model No:	CL304
Serial No:	3616
Calibration Recall No:	28756

Submitted By:

Customer:	EVAN R. ZEIDERS
Company:	SKELLY & LOY, INC.
Address:	449 EISENHOWER BLVD., STE. 300
	HARRISBURG PA 17111

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. CL304 METR

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.
The information supplied relates to the calibrated item listed above.
West Caldwell Calibration Laboratories' calibration control system meets the requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2008 and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by: Fc

Calibration Date: 26-Apr-18

Felix Christopher (QA Mgr.)

Certificate No: 28756 - 5

ISO/IEC 17025:2005

ACCREDITED

Calibration Lab. Cert. # 1533.01

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor NY 14564

ISO/IEC 17025: 2005
ACCREDITED
Calibration Lab. Cert. # 1533.01

REPORT OF CALIBRATION

for

Metrosonics Acoustical Calibrator **Model No.: CL304** **Serial No.: 3616**
Company: Skelly & Loy, Inc. **I. D. No.: XXXX**

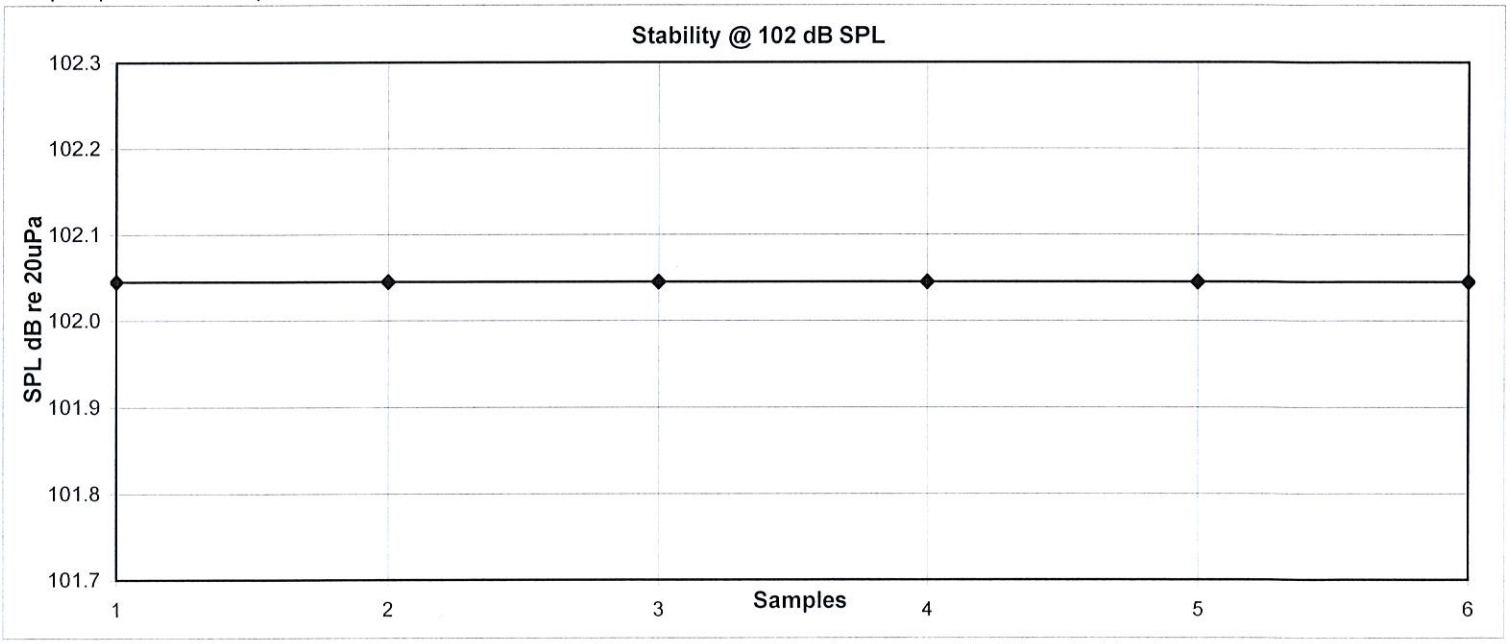
Calibration results:

Before data: ..... **After data:** ...X...
Before & after data same: .....
Sound Pressure Level at 999.99 Hz and pressure of 1013 hPa (mbar)
was 102.05 dB re 20 µPa
Sound Pressure Level: Pass
Frequency: Pass
Distortion: Pass
Stability: Pass
All tested parameters: Pass

Laboratory Environment:		
Ambient Temperature:	20.2	°C
Ambient Humidity:	32.6	% RH
Ambient Pressure:	98.624	kPa
Calibration Date:	26-Apr-2018	
Calibration Due:	26-Apr-2019	
Report Number:	28756 -5	
Control Number:	28756	

The above listed instrument meets or exceeds the tested manufacturer's specifications.
This Calibration is traceable through NIST test numbers: 822/275722-14
The expanded uncertainty of calibration: 0.11 dB at 95% confidence level with a coverage factor of k=2.

Graph represents six samples of Sound Pressure Level measured at 5sec. interval.



The above listed instrument was checked using calibration procedure documented in West Caldwell Calibration Laboratories Inc. procedure : **Rev. 7.0 Jan. 24, 2014 Doc. # 1038 CL304METR**
Calibration was performed by West Caldwell Calibration Laboratories Inc. under Operating Procedures intended to implement the requirements of ISO10012-1, IEC Guide 25, ANSI/NCSL Z540-1, (MIL-STD-45662A) and ISO 9001:2008, ISO 17025

Cal. Date: 26-Apr-2018
Calibrated on WCCL system type 9700

Measurements performed by: .....
James Zhu

West Caldwell Calibration Laboratories Inc.
1575 State Route 96, Victor NY 14564
Tel. (585) 586-3900 FAX (585) 586-4327

Calibration Data Record

for

Metrosonics Acoustical Calibrator **Model No.: CL304** **Serial No.: 3616**
Company: Skelly & Loy, Inc.

All tested parameters: Pass

Measured Sound Pressure Level (Six samples measured at 5 sec. interval)

Sample	1	102.05 dB re 20 µPa	
	2	102.05	
	3	102.05	
	4	102.05	
	5	102.05	
	6	102.05	
	Average	**102.05**	Spec. 102 dB ± 0.3 dB

Frequency measured (Three samples at 30 sec. Interval)

Sample	1	999.96 Hz	
	2	1000.00	
	3	1000.00	
	Average	**999.99**	Spec. 1000 Hz ± 2.0%

Distortion measured	-42.7 dB	Spec. ≤-34 dB

Instruments used for calibration:			Date of Cal.	Traceability No.	Re-cal. Due Date
Brüel & Kjær	4231	S/N 2308998	1-Aug-2017	822/275722-14	1-Aug-2018
Brüel & Kjær	4134	S/N 854464	1-Aug-2017	822/275722-14	1-Aug-2018
Brüel & Kjær	2669	S/N 2148476	1-Aug-2017	683/281764-14	1-Aug-2018
HP	34401A	S/N US360980	1-Aug-2017	,205342	1-Aug-2018
Brüel & Kjær	2636	S/N 1323964	1-Aug-2017	822/275722-14	1-Aug-2018

Cal. Date: 26-Apr-2018 **Tested by: James Zhu**

Calibrated on WCCL system type 9700

Rev. 7.0 Jan. 24, 2014 Doc. # 1038CL304METR

********* ********* ********* ********* ********* **********

Filename... ..... .M-01
Test Locati n..... .150 Knoll Drive
Employee N e..... .ERZ
Employee N ber..... .
Departmen ..... .Env
I- 83 N Georg e Monitori g
10 Minute

Calibrator Type..... .CL304 S.N. 3616
Calibrator C al. Date.. .4-26-18
********* ********* ********* ********* ********* **********

METROSON db-3080 V 1.12 SERIA L # 3895
REPORT PR ED ON 05/(8/18 at 14: 11:51

User ID: __ _____ _____ _____

LOGGING S TED.....0 5/08/18 at 12:56:00
TOTAL LOG G TIME...0 DAYS 00:13 :41
LOGGING S PED.....0 5/08/18 at 13:09:41
TOTAL INTE ALS.....2 8
INTERVAL L GTH.....0 0:00:30

AUTO STOF .....N O
CLOCK SYN .....Y ES
RESPONSE E.....S LOW
FILTER..... .....A WT.

PRE-TEST C IBRATION T IME....05/0 8/18 AT 11 46:38:00
PRE-TEST C IBRATION F ANGE...39.! TO 139.5 d B
POST-TEST LIBRATION TIME...05/(8/18 AT 14 2:29
POST-TEST LIBRATION RANGE...39 5 TO 139.5
CUTOFF US FOR TIME H ISTORY Lav ..NONE

<<< SUMM REPORT FC TEST NUMI R 1 OF 1 >> >

EXCHANGE E..... .3dB
CUTOFFS... ..... . 80dB 90d B

CEILING..... ..... .115dB
DOSE CRITE ON LEVEL.. . 90dB
DOSE CRITE ON LENGTH . 8 HOURS

Lav..... ... 76.2d B
Lav (80)... ... 71.4d B
Lav (90)... ... 52.0d B
SEL..... ... 105.3d B

TWA..... ... 60.8d B
TWA (80).. ... 56.0d B
TWA (90).. ... 39.5d B

Lmax..... ... 90.1d B 05/08/1 at 13:09:2 7
Lpk..... ... 112.6d B 05/08/1 at 13:09:2 7
TIME OVER 5dB...00:0 00:00.0

DOSE (80). 0.03%
PROJ. DOSE 80).. 1.05%
DOSE (90). 0.00%
PROJ. DOSE 90).. 0.00%

<<< TIME H TORY REPC T FOR TEST NUMBER 1 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA	
5/8/2018						
12:56:00	76.4	82	UNDER	79.5	69.5	43651583
12:56:30	75.2	81.7	UNDER	80.5	64.5	33113112
12:57:00	77.1	80.8	UNDER	79.5	68.5	51286138
12:57:30	77.1	82.4	UNDER	80.5	65.5	51286138
12:58:00	75.7	80.3	UNDER	77.5	67.5	37153523
12:58:30	69.3	73.6	UNDER	72.5	62.5	8511380
12:59:00	76.3	80.8	UNDER	79.5	69.5	42657952
12:59:30	79.2	83.6	UNDER	81.5	73.5	83176377
13:00:00	76.3	81.2	UNDER	80.5	65.5	42657952
13:00:30	75.9	84.8	UNDER	81.5	65.5	38904514
13:01:00	76.3	84	UNDER	79.5	70.5	42657952
13:01:30	75.5	81.2	UNDER	78.5	63.5	35481339
13:02:00	74.5	78.9	UNDER	77.5	62.5	28183829
13:02:30	74.2	78.4	UNDER	77.5	66.5	26302680
13:03:00	74.7	79.2	UNDER	77.5	68.5	29512092
13:03:30	75.6	81	UNDER	79.5	68.5	36307805
13:04:00	77.9	81.6	UNDER	80.5	68.5	61659500
13:04:30	77.9	85.6	UNDER	82.5	65.5	61659500
13:05:00	73.3	80	UNDER	75.5	64.5	21379621

13:05:30	75.2	80.8	UNDER		79.5	64.5	33113112
13:06:00	77	84	UNDER		81.5	66.5	50118723
13:06:30	75.4	80.8	UNDER		78.5	63.5	34673685
13:07:00	75	81.6	UNDER		78.5	66.5	31622777
13:07:30	75.6	80.8	UNDER		79.5	64.5	36307805
13:08:00	74.6	80.4	UNDER		77.5	68.5	28840315
13:08:30	74.1	80	UNDER		77.5	67.5	25703958
13:09:00	80.3	90.1		112.6	82.5	73.5	1.07E+08
13:09:30	79	80.8	UNDER		80.5	76.5	79432823

APPENDIX B -
BARRIER ANALYSIS TABLE

NSA 05b Noise Barrier Details

			12 foot barrier		13 foot barrier		14 foot barrier		15 foot barrier		16 foot barrier		17 foot barrier		18 foot barrier	
Receptor ID	**Residences or Equivalent Residential Units Represented**	**2042 AM Peak Modeled Noise Level Pre-Barrier Leq (dBA)**	**2042 AM Modeled Noise Level Post-Barrier Leq (dBA)**	**Insertion Loss**	**2042 AM Modeled Noise Level Post-Barrier Leq (dBA)**	**Insertion Loss**	**2042 AM Modeled Noise Level Post-Barrier Leq (dBA)**	**Insertion Loss**	**2042 AM Modeled Noise Level Post-Barrier Leq (dBA)**	**Insertion Loss**	**2042 AM Modeled Noise Level Post-Barrier Leq (dBA)**	**Insertion Loss**	**2042 AM Modeled Noise Level Post-Barrier Leq (dBA)**	**Insertion Loss**	**2042 AM Modeled Noise Level Post-Barrier Leq (dBA)**	**Insertion Loss**
A	3	**77**	**67.7**	**9.7**	**67.1**	**10.3**	**66.5**	**10.9**	**66.0**	**11.4**	**65.6**	**11.8**	65.3	**12.1**	64.9	**12.5**
2-01	5	**75**	**66.8**	**8.6**	**66.0**	**9.4**	65.4	**10.0**	65.0	**10.4**	64.6	**10.8**	64.2	**11.2**	63.8	**11.6**
2-02	5	**75**	**65.6**	**9.1**	64.9	**9.8**	64.3	**10.4**	63.8	**10.9**	63.4	**11.3**	63.0	**11.7**	62.6	**12.1**
2-03	5	**70**	62.6	**7.7**	62.0	**8.3**	61.4	**8.9**	60.9	**9.4**	60.5	**9.8**	60.1	**10.2**	59.7	**10.6**
2-04	5	**70**	62.9	**7.5**	62.2	**8.2**	61.6	**8.8**	61.1	**9.3**	60.7	**9.7**	60.2	**10.2**	59.8	**10.6**
2-05	5	**71**	63.2	**7.5**	62.5	**8.2**	62.0	**8.7**	61.4	**9.3**	61.0	**9.7**	60.5	**10.2**	60.2	**10.5**
2-06	4	**69**	63.3	**5.7**	62.7	**6.3**	62.3	**6.7**	61.9	**7.1**	61.6	**7.4**	61.3	**7.7**	61.0	**8.0**
2-07	4	62	58.5	3.9	57.7	**4.7**	57.2	**5.2**	56.7	**5.7**	56.3	**6.1**	56.0	**6.4**	55.7	**6.7**
2-08	4	63	59.3	4.1	58.6	**4.8**	58.1	**5.3**	57.6	**5.8**	57.2	**6.2**	56.8	**6.6**	56.5	**6.9**
2-09	5	64	60.1	4.2	59.4	**4.9**	58.9	**5.4**	58.6	**5.7**	58.3	**6.0**	58.1	**6.2**	57.8	**6.5**
2-10	5	65	60.5	4.1	59.9	**4.7**	59.5	**5.1**	59.2	**5.4**	58.6	**6.0**	58.4	**6.2**	58.2	**6.4**
2-11	4	**66**	61.5	**4.8**	60.7	**5.6**	59.9	**6.4**	59.4	**6.9**	58.9	**7.4**	58.4	**7.9**	57.9	**8.4**
2-12	2	65	61.2	3.8	60.0	**5.0**	59.2	**5.8**	58.7	**6.3**	58.2	**6.8**	57.7	**7.3**	57.2	**7.8**
impacts	36		total benefits	36	total benefits	56	total benefits	56	total benefits	56	total benefits	56	total benefits	56	total benefits	56
			36 impacted benefits		33 impacted benefits		33 impacted benefits		36 impacted benefits		36 impacted benefits		36 impacted benefits		36 impacted benefits	
			0 non-impacted benefits		20 non-impacted benefits		20 non-impacted benefits		20 non-impacted benefits		20 non-impacted benefits		20 non-impacted benefits		20 non-impacted benefits	
			barrier length =	**2,182**	**barrier length =**	**2,182**	**barrier length =**	**2,182**	**barrier length =**	**2,182**	**barrier length =**	**2,182**	**barrier length =**	**2,182**	**barrier length =**	**2,182**
				2,182		2,182		2,182		2,182		2,182		2,182		2,182
			total area =	**26,186**	**total area =**	**28,368**	**total area =**	**30,550**	**total area =**	**32,732**	**total area =**	**34,914**	**total area =**	**37,096**	**total area =**	**39,278**
				26,186		28,368		30,550		32,732		34,914		37,096		39,278
			SF/BR =	**727**	**SF/BR =**	**507**	**SF/BR =**	**546**	**SF/BR =**	**585**	**SF/BR =**	**623**	**SF/BR =**	**662**	**SF/BR =**	**701**
			Min Height =	12.00	Min Height =	13.00	Min Height =	14.00	Min Height =	15.00	Min Height =	16.00	Min Height =	17.00	Min Height =	18.00
			Avg Height =	12.00	Avg Height =	13.00	Avg Height =	14.00	Avg Height =	15.00	Avg Height =	16.00	Avg Height =	17.00	Avg Height =	18.00
			Max Height =	12.00	Max Height =	13.00	Max Height =	14.00	Max Height =	15.00	Max Height =	16.00	Max Height =	17.00	Max Height =	18.00
	denotes noise impact (Category B residential noise level predicted to equal or exceed 66 dBA)															
	denotes benefit from effective noise abatement (noise reduction >/= 5 dBA)															

APPENDIX C -
TRAFFIC DATA

10 Minute Site Measurement — Site A

5/8/2018 — 12:58:00-13:08:00 — TMS 1-1

	NB
C	182
M	16
H	45

	SB
C	220
M	29
H	33

1 Hour

NB	
C	1092
M	96
H	270

SB	
C	1320
M	174
H	198

Roadway	Dir.	Existing		2042 Design Year		Truck %	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
I-83, south of Exit 22	NB	2,240	2,390	2,650	2,850	11%	9%
	SB	2,220	2,690	2,720	3,190	9%	6%
I-83, north of Exit 22	NB	2,300	2,300	2,700	2,800	13%	10%
	SB	2,410	2,370	2,910	2,900	11%	9%
SR 0181	NB	425	410	985	1,340	1%	2%
	SB	555	705	835	1,080	1%	2%
Proposed Ramp (Ramp E)	-	405	460	475	655	14%	7%

* Traffic volumes at existing I-83 northbound on-ramp from SR 0181 (i.e., loop ramp located in southeast quadrant of Exit 22 interchange)

APPENDIX D - WARRANTED, FEASIBLE, AND REASONABLE WORKSHEETS

Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet – Noise Wall

Date 8/14/2018
Project Name SR 181-017 NORTH GEORGE STREET/EXIT 22 IMPROVEMENTS
County York
SR, Section SR 181-017
Community Name and/or NSA # NSA 1
Noise Wall Identification (i.e., Wall 1) N/A

General

1. Type of project (new location, reconstruction, etc.): New ramp/ acceleration lane to I-83

2. Total number of impacted receptor units in community
   - Category A units impacted: 0
   - Category B units impacted: 8
   - Category C units impacted: 0
   - Category D units impacted (if interior analysis required): 0
   - Category E units impacted: 0

Warranted

1. Community Documentation
   a. Date community was permitted (for new developments or developments planned for or under construction)
   b. Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):
   c. Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of *CE, ROD, or FONSI, as appropriate*." ☑ Yes ☐ No

2. Criteria requiring consideration of noise abatement (note N/A if category is not impacted or present or analysis not required). A "yes" answer to any of the following three questions requires the consideration of noise abatement.
   a. With the proposed project, are design year noise levels predicted to approach or exceed the NAC level(s) in Table 1? ☑ Yes ☐ No
   b. With the proposed project, is there predicted to be a substantial design year noise level increase of 10 dB(A) or more at Activity Category A, B, C, D, or E receptor(s)? ☐ Yes ☑ No

c. With the proposed project, are design year noise levels predicted to be less than existing noise levels, but still approach or exceed the NAC levels in Table 1 for the relevant Activity Category? ☐ Yes ☑ No

Feasibility – Questions 1c through 7 must all be answered "yes" for a noise barrier to be determined to be feasible.

1. Impacted receptor units
   a. Total number of impacted receptor units: 8
   b. Percentage of impacted receptor units receiving 5 dB(A) or more insertion loss: N/A
   c. Is the percentage 50 or greater? ☐ Yes ☑ No
2. Can the noise wall be designed and physically constructed at the proposed location? ☐ Yes ☑ No
3. Can the noise wall be constructed without causing a safety problem? ☐ Yes ☑ No
4. Can the noise wall be constructed without restricting access to vehicular or pedestrian travel? ☐ Yes ☑ No
5. Can the noise wall be constructed in a manner that allows for access for required maintenance and inspection operations? ☐ Yes ☐ No
6. Can the noise wall be constructed in a manner that permits utilities to function in a normal manner? ☐ Yes ☐ No
7. Can the noise wall be constructed in a manner that permits drainage features to function in a normal manner? ☐ Yes ☐ No

Reasonableness

1. Community Desires Related to the Barrier
   a. Do at least 50 percent of the responding benefited receptor unit owner(s) and renters desire the noise wall? If yes, continue with Reasonableness questions. If no, the noise wall can be considered not to be reasonable. Proceed to "Decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the benefited receptor unit owners do not desire the noise wall." ☐ Yes ☐ No

2. Square Footage Per Benefited Receptor (SF/BR) Evaluation
   a. Area (SF) of the proposed noise wall _____
   b. Number of benefited receptor units (any unit receiving 5 dB(A) or more insertion loss) _____
   c. SF/BR = 2a/2b _____
   d. Is 2c less than or equal to the MaxSF/BR value of 2000? ☐ Yes ☐ No

3. Noise Reduction Design Goals (Activity Categories A, B, C, and E) A "yes" answer is required to Question 3a. for the noise wall to be determined to be reasonable. Questions 3b through 3e represent desirable goals that need not be met for a noise wall to be determined reasonable. However, they must be addressed and should be considered in the determination of the recommended noise wall.
   a. Does the noise wall reduce design year exterior noise levels by at least 7 dB(A) for at least one benefited receptor? ☐ Yes ☐ No
   b. Does the noise wall provide an insertion loss of at least 7 dB(A) for more receptors than required under 3a.while still conforming to the MaxSF/BR value of 2,000 and a "point of diminishing returns" evaluation? ☐ Yes ☐ No
   c. Does the noise wall provide insertion losses of greater than 7 dB(A) while still conforming to the MaxSF/BR value of 2,000 and a "point of diminishing returns" evaluation? ☐ Yes ☐ No
   d. Does the noise wall reduce future exterior levels to the low-60-decibel range (60-63) for Category B and C receptors and the upper-60 dB(A) range (65-68) for Category E receptors? ☐ Yes ☐ No
   e. Does the noise wall reduce design year noise levels back to existing levels? ☐ Yes ☐ No

4. Noise Reduction Design Goals (Activity Category D) A "yes" answer is required to Question 4a. for the barrier to be determined to be reasonable. Question 4b represents a desirable goal that need not be met for a noise wall to be determined reasonable. However, this goal must be addressed and should be considered in the determination of the recommended noise wall.
   a. Does noise wall reduce design year interior noise levels by at least 7 dB(A) for the facility's analysis point? ☐ Yes ☐ No
   b. While conforming to the MaxSF/BR criteria and justified by a "point of diminishing returns' evaluation, does the noise wall provide an interior insertion loss above the 7 dB(A) minimum ☐ Yes ☐ No

Decision

Is the Noise Wall WARRANTED? ☑ Yes ☐ No

Is the Noise Wall FEASIBLE? ☐ Yes ☑ No

Is the Noise Wall REASONABLE? ☐ Yes ☑ No

Additional Reasons for Decision:

Due to property access requirements, placement of a noise barrier is not feasible for NSA 1

Responsible/Qualified Individuals Making the Above Decisions

_____ Date:_____

PennDOT, Engineering District Environmental Manager

Evan Zeiders, Environmental Scientist, Skelly and Loy, Inc. Date: 8/14/2018

Qualified Professional Performing the Analysis
(name, title, and company name)

Highway Traffic Noise Abatement

Warranted, Feasible, and Reasonable Worksheet – Noise Berm

Date_____
Project Name_____
County_____
SR, Section_____
Community Name and/or NSA # _____
Noise Wall Identification (i.e., Wall 1) _____

General

1. Type of project (new location, reconstruction, etc.): _____

2. Total number of impacted receptor units in community/
   Category A units impacted _____
   Category B units impacted _____
   Category C units impacted _____
   Category D units impacted (if interior analysis required) _____
   Category E units impacted _____

Warranted

1. Community Documentation
   a. Date community was permitted (for new developments or developments planned for or under construction) _____
   b. Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI): _____
   c. Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of *CE, ROD, or FONSI, as appropriate*." ☐ Yes ☐ No

2. Criteria requiring consideration of noise abatement (note N/A if category is not impacted or present or analysis not required). A "yes" answer to any of the following three questions requires the consideration of noise abatement.
   a. With the proposed project, are design year noise levels predicted to approach or exceed the NAC level(s) in Table 1? ☐ Yes ☐ No
   b. With the proposed project, is there predicted to be a substantial design year noise level increase of 10 dB(A) or more at Activity Category A, B, C, D, or E receptor(s)? ☐ Yes ☐ No
   c. With the proposed project, are design year noise levels predicted to be less than existing noise levels, but predicted design year noise levels still predicted to approach or exceed the NAC levels in Table 1 for the relevant Activity Category? ☐ Yes ☐ No

Feasibility – Questions 1c through 7 must all be answered "yes" for a noise berm to be determined to be feasible.

1. Impacted receptor units
   a. Total number of impacted receptor units: _____
   b. Percentage of impacted receptor units receiving 5 dB(A) or more insertion loss: _____
   c. Is the percentage 50 or greater? ☐ Yes ☐ No
2. Can the noise berm be designed and physically constructed at the proposed location? ☐ Yes ☐ No
3. Can the noise berm be constructed without causing a safety problem? ☐ Yes ☐ No
4. Can the noise berm be constructed without restricting access to vehicular or pedestrian travel? ☐ Yes ☐ No
5. Can the noise berm be constructed in a manner that allows for access for required maintenance and inspection operations? ☐ Yes ☐ No
6. Can the noise berm be constructed in a manner that permits utilities to function in a normal manner? ☐ Yes ☐ No
7. Can the noise berm be constructed in a manner that permits drainage features to function in a normal manner? ☐ Yes ☐ No

Reasonableness

1. Community Desires Related to the Barrier
   a. Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise berm? If yes, continue with Reasonableness questions. If no, the berm can be considered not to be reasonable. Proceed to "Decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the benefited receptor unit owners and renters do not desire the berm." ☐ Yes ☐ No

2. Cubic Yards Per Benefited Receptor (CY/BR) Evaluation
   a. Volume (CY) of the proposed noise barrier _____
   b. Number of benefited receptor units (any unit receiving 5 dB(A) or more insertion loss) _____
   c. CY/BR = 2a/2b _____
   d. Is 2c less than or equal to the MaxCY/BR value of 1200? ☐ Yes ☐ No

3. Noise Reduction Design Goals (Activity Categories A, B, C, and E) A "yes" answer is required to both Questions 3a. and 3b. for the barrier to be determined to be reasonable. Questions 3c. and 3d. represent desirable goals that need not be met for a noise berm to be determined reasonable. However, they must be addressed and should be considered in the determination of the recommended noise berm.
   a. Does the berm reduce future noise levels by at least 7 dB(A) for 50% or more of the benefited receptors? ☐ Yes ☐ No
   b. Is the estimated net cost of the noise berm less than $50,000 per benefited receptor unit? ☐ Yes ☐ No

c. Does the berm provide insertion loss above 7 dB(A) while still conforming to the MaxCY/BR value of 1200? ☐ Yes ☐ No

d. Does the berm reduce future exterior levels to the low-60-decibel range (60-63) for Category B and C receptors and the upper-60 dB(A) range (65-68) for Category E receptors? ☐ Yes ☐ No

4. Noise Reduction Design Goals (Activity Category D) A "yes" answer is required to both Questions 4a. and 4b. for the berm to be determined to be reasonable. Question 4c represents a desirable goal that need not be met for a noise berm to be determined reasonable. However, this goal must be addressed and should be considered in the determination of the recommended noise berm.

   a. Does noise berm reduce design year interior noise levels by at least 7 dB(A) for the facility's analysis point? ☐ Yes ☐ No

   b. Is the estimated net cost of the noise berm less than $50,000 per benefited receptor unit? ☐ Yes ☐ No

   c. While conforming to the MaxCY/BR criteria and justified by a "point of diminishing returns' evaluation, does the noise berm provide an interior insertion loss above the 7 dB(A) minimum ☐ Yes ☐ No

Decision

Is the Noise Berm WARRANTED? ☐ Yes ☐ No

Is the Noise Berm FEASIBLE? ☐ Yes ☐ No

Is the Noise Berm REASONABLE? ☐ Yes ☐ No

Additional Reasons for Decision:

Responsible/Qualified Individuals Making the Above Decisions

_____ Date:_____
PennDOT, Engineering District Environmental Manager

_____ Date:_____
Qualified Professional Performing the Analysis
(name, title, and company name)

Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet – Noise Wall

Date 7-26-2018
Project Name SR 181-017 NORTH GEORGE STREET/EXIT 22 IMPROVEMENTS
County York
SR, Section SR 181-017
Community Name and/or NSA # NSA 2
Noise Wall Identification (i.e., Wall 1) Noise Wall 1

General

1. Type of project (new location, reconstruction, etc.): New ramp/ acceleration lane to I-83

2. Total number of impacted receptor units in community
   - Category A units impacted: 0
   - Category B units impacted: 56
   - Category C units impacted: 0
   - Category D units impacted (if interior analysis required): 0
   - Category E units impacted: 0

Warranted

1. Community Documentation
   a. Date community was permitted (for new developments or developments planned for or under construction)
   b. Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):
   c. Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of *CE, ROD, or FONSI, as appropriate*." ☑ Yes ☐ No

2. Criteria requiring consideration of noise abatement (note N/A if category is not impacted or present or analysis not required). A "yes" answer to any of the following three questions requires the consideration of noise abatement.
   a. With the proposed project, are design year noise levels predicted to approach or exceed the NAC level(s) in Table 1? ☑ Yes ☐ No
   b. With the proposed project, is there predicted to be a substantial design year noise level increase of 10 dB(A) or more at Activity Category A, B, C, D, or E receptor(s)? ☐ Yes ☑ No

c. With the proposed project, are design year noise levels predicted to be less than existing noise levels, but still approach or exceed the NAC levels in Table 1 for the relevant Activity Category? ☐ Yes ☑ No

Feasibility – Questions 1c through 7 must all be answered "yes" for a noise barrier to be determined to be feasible.

1. Impacted receptor units
   a. Total number of impacted receptor units: 56
   b. Percentage of impacted receptor units receiving 5 dB(A) or more insertion loss: 100
   c. Is the percentage 50 or greater? ☑ Yes ☐ No
2. Can the noise wall be designed and physically constructed at the proposed location? ☑ Yes ☐ No
3. Can the noise wall be constructed without causing a safety problem? ☑ Yes ☐ No
4. Can the noise wall be constructed without restricting access to vehicular or pedestrian travel? ☑ Yes ☐ No
5. Can the noise wall be constructed in a manner that allows for access for required maintenance and inspection operations? ☑ Yes ☐ No
6. Can the noise wall be constructed in a manner that permits utilities to function in a normal manner? ☑ Yes ☐ No
7. Can the noise wall be constructed in a manner that permits drainage features to function in a normal manner? ☑ Yes ☐ No

Reasonableness

1. Community Desires Related to the Barrier
   a. Do at least 50 percent of the responding benefited receptor unit owner(s) and renters desire the noise wall? If yes, continue with Reasonableness questions. If no, the noise wall can be considered not to be reasonable. Proceed to "Decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the benefited receptor unit owners do not desire the noise wall." ☐ Yes ☐ No

2. Square Footage Per Benefited Receptor (SF/BR) Evaluation
   a. Area (SF) of the proposed noise wall 37,096
   b. Number of benefited receptor units (any unit receiving 5 dB(A) or more insertion loss) 56
   c. SF/BR = 2a/2b 662
   d. Is 2c less than or equal to the MaxSF/BR value of 2000? ☑ Yes ☐ No

3. Noise Reduction Design Goals (Activity Categories A, B, C, and E) A "yes" answer is required to Question 3a. for the noise wall to be determined to be reasonable. Questions 3b through 3e represent desirable goals that need not be met for a noise wall to be determined reasonable. However, they must be addressed and should be considered in the determination of the recommended noise wall.
   a. Does the noise wall reduce design year exterior noise levels by at least 7 dB(A) for at least one benefited receptor? ☑ Yes ☐ No
   b. Does the noise wall provide an insertion loss of at least 7 dB(A) for more receptors than required under 3a.while still conforming to the MaxSF/BR value of 2,000 and a "point of diminishing returns" evaluation? ☑ Yes ☐ No
   c. Does the noise wall provide insertion losses of greater than 7 dB(A) while still conforming to the MaxSF/BR value of 2,000 and a "point of diminishing returns" evaluation? ☑ Yes ☐ No
   d. Does the noise wall reduce future exterior levels to the low-60-decibel range (60-63) for Category B and C receptors and the upper-60 dB(A) range (65-68) for Category E receptors? ☑ Yes ☐ No
   e. Does the noise wall reduce design year noise levels back to existing levels? ☐ Yes ☐ No

4. Noise Reduction Design Goals (Activity Category D) A "yes" answer is required to Question 4a. for the barrier to be determined to be reasonable. Question 4b represents a desirable goal that need not be met for a noise wall to be determined reasonable. However, this goal must be addressed and should be considered in the determination of the recommended noise wall.
   a. Does noise wall reduce design year interior noise levels by at least 7 dB(A) for the facility's analysis point? ☐ Yes ☐ No
   b. While conforming to the MaxSF/BR criteria and justified by a "point of diminishing returns' evaluation, does the noise wall provide an interior insertion loss above the 7 dB(A) minimum ☐ Yes ☐ No

Decision

Is the Noise Wall WARRANTED? ☑ Yes ☐ No

Is the Noise Wall FEASIBLE? ☑ Yes ☐ No

Is the Noise Wall REASONABLE? ☑ Yes ☐ No

Additional Reasons for Decision:

Responsible/Qualified Individuals Making the Above Decisions

_____ Date:_____

PennDOT, Engineering District Environmental Manager

Evan Zeiders, Environmental Scientist, Skelly and Loy, Inc. Date: 7-26-2018

Qualified Professional Performing the Analysis
(name, title, and company name)

Highway Traffic Noise Abatement

Warranted, Feasible, and Reasonable Worksheet – Noise Berm

Date_____
Project Name_____
County_____
SR, Section_____
Community Name and/or NSA # _____
Noise Wall Identification (i.e., Wall 1) _____

General

1. Type of project (new location, reconstruction, etc.): _____

2. Total number of impacted receptor units in community/
   Category A units impacted _____
   Category B units impacted _____
   Category C units impacted _____
   Category D units impacted (if interior analysis required) _____
   Category E units impacted _____

Warranted

1. Community Documentation
   a. Date community was permitted (for new developments or developments planned for or under construction) _____
   b. Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI): _____
   c. Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of *CE, ROD, or FONSI, as appropriate*." ☐ Yes ☐ No

2. Criteria requiring consideration of noise abatement (note N/A if category is not impacted or present or analysis not required). A "yes" answer to any of the following three questions requires the consideration of noise abatement.
   a. With the proposed project, are design year noise levels predicted to approach or exceed the NAC level(s) in Table 1? ☐ Yes ☐ No
   b. With the proposed project, is there predicted to be a substantial design year noise level increase of 10 dB(A) or more at Activity Category A, B, C, D, or E receptor(s)? ☐ Yes ☐ No
   c. With the proposed project, are design year noise levels predicted to be less than existing noise levels, but predicted design year noise levels still predicted to approach or exceed the NAC levels in Table 1 for the relevant Activity Category? ☐ Yes ☐ No

Feasibility – Questions 1c through 7 must all be answered "yes" for a noise berm to be determined to be feasible.

1. Impacted receptor units
   a. Total number of impacted receptor units: _____
   b. Percentage of impacted receptor units receiving 5 dB(A) or more insertion loss: _____
   c. Is the percentage 50 or greater? ☐ Yes ☐ No
2. Can the noise berm be designed and physically constructed at the proposed location? ☐ Yes ☐ No
3. Can the noise berm be constructed without causing a safety problem? ☐ Yes ☐ No
4. Can the noise berm be constructed without restricting access to vehicular or pedestrian travel? ☐ Yes ☐ No
5. Can the noise berm be constructed in a manner that allows for access for required maintenance and inspection operations? ☐ Yes ☐ No
6. Can the noise berm be constructed in a manner that permits utilities to function in a normal manner? ☐ Yes ☐ No
7. Can the noise berm be constructed in a manner that permits drainage features to function in a normal manner? ☐ Yes ☐ No

Reasonableness

1. Community Desires Related to the Barrier
   a. Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise berm? If yes, continue with Reasonableness questions. If no, the berm can be considered not to be reasonable. Proceed to "Decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the benefited receptor unit owners and renters do not desire the berm." ☐ Yes ☐ No

2. Cubic Yards Per Benefited Receptor (CY/BR) Evaluation
   a. Volume (CY) of the proposed noise barrier _____
   b. Number of benefited receptor units (any unit receiving 5 dB(A) or more insertion loss) _____
   c. CY/BR = 2a/2b _____
   d. Is 2c less than or equal to the MaxCY/BR value of 1200? ☐ Yes ☐ No

3. Noise Reduction Design Goals (Activity Categories A, B, C, and E) A "yes" answer is required to both Questions 3a. and 3b. for the barrier to be determined to be reasonable. Questions 3c. and 3d. represent desirable goals that need not be met for a noise berm to be determined reasonable. However, they must be addressed and should be considered in the determination of the recommended noise berm.
   a. Does the berm reduce future noise levels by at least 7 dB(A) for 50% or more of the benefited receptors? ☐ Yes ☐ No
   b. Is the estimated net cost of the noise berm less than $50,000 per benefited receptor unit? ☐ Yes ☐ No

c. Does the berm provide insertion loss above 7 dB(A) while still conforming to the MaxCY/BR value of 1200? ☐ Yes ☐ No

d. Does the berm reduce future exterior levels to the low-60-decibel range (60-63) for Category B and C receptors and the upper-60 dB(A) range (65-68) for Category E receptors? ☐ Yes ☐ No

4. Noise Reduction Design Goals (Activity Category D) A "yes" answer is required to both Questions 4a. and 4b. for the berm to be determined to be reasonable. Question 4c represents a desirable goal that need not be met for a noise berm to be determined reasonable. However, this goal must be addressed and should be considered in the determination of the recommended noise berm.

   a. Does noise berm reduce design year interior noise levels by at least 7 dB(A) for the facility's analysis point? ☐ Yes ☐ No

   b. Is the estimated net cost of the noise berm less than $50,000 per benefited receptor unit? ☐ Yes ☐ No

   c. While conforming to the MaxCY/BR criteria and justified by a "point of diminishing returns' evaluation, does the noise berm provide an interior insertion loss above the 7 dB(A) minimum ☐ Yes ☐ No

Decision

Is the Noise Berm WARRANTED? ☐ Yes ☐ No

Is the Noise Berm FEASIBLE? ☐ Yes ☐ No

Is the Noise Berm REASONABLE? ☐ Yes ☐ No

Additional Reasons for Decision:

Responsible/Qualified Individuals Making the Above Decisions

_____ Date:_____
PennDOT, Engineering District Environmental Manager

_____ Date:_____
Qualified Professional Performing the Analysis
(name, title, and company name)

APPENDIX E -
TNM FILES
(FTP LINK)

http://www.skellyloy-gis.com/downloads/Final Models.zip